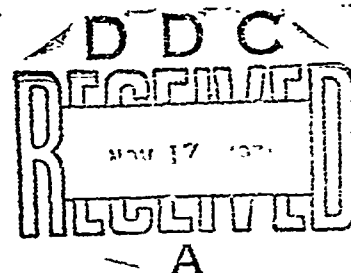


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# 14th MILITARY LIBRARIANS WORKSHOP



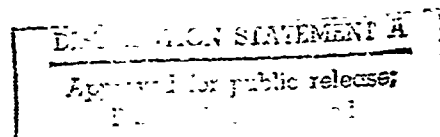
*"Department of Defense Libraries in Transition"*

30 November - 2 December 1970

INDUSTRIAL COLLEGE of the ARMED FORCES  
Washington, D. C.

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*Conference Proceedings*



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P R O C E E D I N G S

14TH MILITARY LIBRARIANS WORKSHOP  
30 NOVEMBER-2 DECEMBER 1970

SPONSOR

Industrial College of the Armed Forces  
Vice Admiral J. V. Smith, Commandant

HOSTESS

Miss Nancy L. Ballard  
Library Director  
Industrial College of the Armed Forces

PROGRAM COMMITTEE

Mr. Paul Klinefelter, Defense Documentation Center, Chairman  
Mrs. Doris Baster, Naval Research Laboratory  
Mrs. Evelyn Branstetter, Air Force Systems Command Headquarters  
Dr. Madeleine J. Wilkins, Office of the Chief of Engineers

PRESIDENT, SLA

Miss Florine Oltman, President  
Special Libraries Association

CHAIRMAN, MLD, SLA

Mr. Egon A. Weiss, Chairman, Military Librarians  
Division, Special Libraries Association

HEADQUARTERS

Marriott "Twin Bridges" Hotel

P R O G R A M

SUNDAY

29 November 1970

1600-1900 Advance Registration Marriott Hotel

MONDAY

30 November 1970

0830 Buses leave Marriott Hotel

0900-1000 Registration (Coffee available on 2d floor) ICAF

1000-1115 Opening Session Auditorium

Welcoming Remarks  
Briefing on the Industrial College of the Armed Forces  
CAPT C. E. Smith, Deputy Director  
Resident School  
Briefing on the Industrial College Library  
Miss Nancy L. Ballard, Library Director  
Administrative Remarks  
Mr. Paul Klinefelter, Chairman,  
Program Committee

1115-1145 Library Open House

1200-1345 Luncheon Fort Leslie J. McNair Officers' Club

1400-1445 "Federal Library Committee"  
Mr. Frank Kurt Cylke, Executive Secretary  
Federal Library Committee

1445-1500 Coffee Break

1500-1600 Workshop Session Assigned Rooms

1615 Buses leave front entrance of ICAF for Marriott Hotel

TUESDAY

1 December 1970

0830 Buses leave Marriott Hotel

0900-0945 Military Librarians Division Meeting, Auditorium  
SLA, Mrs. Doris Baster, Chairman

0945-1015 Coffee Break

1015-1130 Workshop Session Assigned Rooms

1145-1315 Luncheon Fort Leslie J. McNair Officers' Club

1330-1430 Workshop Session Assigned Rooms

1430-1500 Coffee Break

1500-1600 "Wrap-up" Auditorium  
Mr. Paul Klinefelter, Chairman  
Program Committee

1615 Buses leave front entrance of ICAF for Marriott Hotel

1830-1930 No host cocktail party Marriott Hotel

1930 Banquet Marriott Hotel  
"Will Computers Take Over?"  
Dr. Carl Hammer, Director  
Scientific Computer Marketing,  
UNIVAC Division of Sperry Rand

WEDNESDAY

2 December 1970

0830-1200 Tours of Washington Area Libraries  
Defense Documentation Center  
Library of Congress  
National Agricultural Library

# WORKSHOP SESSIONS

GROUP		ROOM
I	"Standardization of Bibliographic Data" Discussion Leader: Robert B. Lane	400
II	"Evolution of Technical Reports" Discussion Leader: Irving G. Carlson	A439
III	"DoD Coordination of Library Services" Discussion Leader: Miss Frances O'Halloran	306
IV	"The Future of On-Line Access to Data Banks" Discussion Leader: Joseph Powers	414
V	"Economic Considerations for Information Services in the Next Decade" Discussion Leader: Lt. Col. Claude J. Johns, Jr.	418
VI	"Evolution of DoD's Information System" Discussion Leader: Miss Elizabeth Jesse	318
VII	"Library Needs in Terms of Suggested DoD Policy" Discussion Leader: Mrs. Barbara Meade	C361
VIII	"Evolution of the Federal Information System" Discussion Leader: Paul Klinefelter	430
IX	"The Future Role of Microform" Discussion Leader: Mrs. Cathryn C. Lyon	314
X	"Modes of Access to Technical Information" Discussion Leader: Dwight C. Lyman	D477

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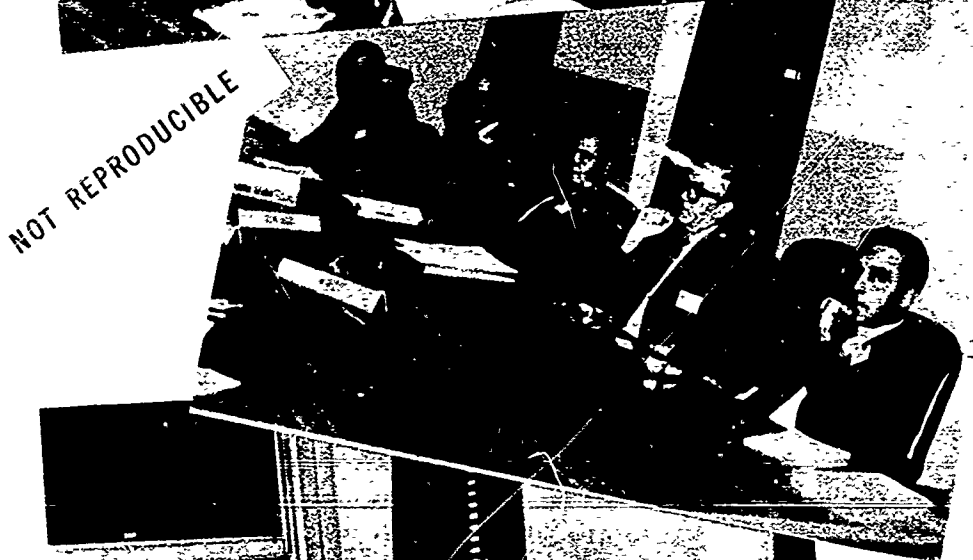




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### WELCOMING REMARKS

Colonel John S. Sullivan, Jr.  
Secretary

Were the Commandant or the Deputy Commandant here he would be standing here. It is a pleasure for me to have this opportunity to welcome this distinguished group which has such an influence on our various libraries. A good example is the Library here in the College which has such an influence on the successful attainment of our educational objectives here and throughout the United States.

There are several reasons, I am sure, that all of you come here. I am really surprised when I look over the list and see we have six from Canada; we have the UK representative, USARPAC, and we have Lieutenant Hoang Ngoc Huu over here from Saigon. I am surprised that Washington, D. C. would have such an attraction.

I recently attended a little conference down at Daytona Beach and there was no problem in getting people to come. But here I think it speaks well for the importance of this 14th seminar grouping that so many of you are here to participate.

The program chairman, the chairmen and others who have been involved in setting this up are certainly to be complimented. As far as the support by the Industrial College is concerned, you can weigh our contribution better at the termination of the exercise because primarily we are interested here in making sure that your facilities are adequate and that everything that you need is taken care of.

I think the subject title is a very interesting one, especially at this time. I am not familiar with the various ramifications but speaking from my limited experience right here at the Industrial College, the term "transition" is a very important one now. I know that our requirements are continually on the increase, though this is not necessarily one of the resources which are supposedly part of the requirement. They may or may not be available to fulfill the requirement.

I hope that Nancy will have an opportunity to speak with each of you and determine what pearls and comments you've got and how you do your work in your place so that we can all benefit from the experience of others. I know that here we have been hit by personnel shortages, by cuts, and we don't know what is coming in the near future.

We also here at the Industrial College seek to continually improve our place. We try to see that the students - the resident school student and the others that are a part of the College - have a better library, better facilities, that the books are more readily obtained, that the books are available when they need them, in sufficient quantities. Nancy not only is short of

people but she has had personnel cuts. I trust that some of this experience she is having has been borne by others and the way to handle these problems will come out.

The National War College and the Industrial College libraries seek to see what support they can give each other. I think that one of the key things of this meeting is that you are able to develop personal relationships which are important in your respective library services after this conference. I would like to say that the subject matter "the libraries in transition" is probably the most pertinent subject that you could bring up, and I trust a lot of benefit will be gained from your workshop. From a look at your schedule you should have a very enjoyable, pleasant, professionally profitable several days.

I trust that if we can be of any support or if you think of something you need, that you will either talk to Nancy Ballard or come in to see me. I am right across the hall and I will be very happy to see if we can't help you out. Thank you very much. Good luck.

## INDUSTRIAL COLLEGE OF THE ARMED FORCES

Captain Charles E. Smith  
Deputy Director, Resident School

May I add my welcome to that of Colonel Sullivan.

My purpose in the next few minutes will be to tell you about the mission of the Industrial College and to describe to you, in general, a little bit of the methodology and curriculum by which we accomplish that objective.

There are three schools at the College: the Correspondence School, the Seminar School, and the Resident School. Being in the Resident School, and since the other schools have different student groups, different time frames, and methodologies, I will limit my remarks to what we do in the Resident School.

At the outset I would like to say how important it is to our efforts in the Resident School to have available a good library and an effective library staff. I think I have been fortunate, not only here but in previous tours at the Armed Forces Staff College and at the Naval War College, to have both. I can assure you that we can't get along without you.

This is our mission provided to us by the Joint Chiefs of Staff. It is very similar to those of the other senior Service colleges. The principal difference lies in the fact that we accent the industrial and economic aspects of national security whereas the other senior Service colleges, for the most part, emphasize the military and political aspects.

The students attending the senior Service colleges are all highly selected. The year they spend here helps to prepare them all for positions of high trust in the national security structure.

This is the breakout of the students attending the Industrial College. About 60 percent are colonels or captains. The educational level is very high. About two-thirds have advanced degrees. Their average age is 43 years.

The civilians come not only from the Department of Defense but also from other governmental departments and agencies such as Health, Education, and Welfare, CIA, CAO, State Department, Commerce Department, and Agriculture Department.

Before taking up the curriculum, a word about our methodology. These are the various methods we use to accomplish our objectives. We strive to use the method best suited to the particular session keeping in mind that it is desirable to have a mix or variety in the methods used.

One method left out here is a very important one and that is reading. The reason it is left out is because reading is used throughout the course. Every session, regardless of methodology, has a reading assignment. Some

of the materials in this essential reading, as we call it, are selected by the Course Directors from the "Blue Books." Every student has a set of these books which are prepared here in the College.

Other parts of the reading are taken from books that are kept in the students rooms, the room sets, which are kept current by the librarians. Finally the remainder of the reading is selected from other sources that are not so readily available. We assemble these in booklets called anthologies which are passed out to the students; and this is a chore that the librarian also does so well.

Now a little about the various methodologies. Starting at the bottom, if you will, the individual student can be involved in a student research activity or research project in which he selects a topic and pursues it throughout the year doing research in depth and producing a 10,000 to 12,000 word paper.

The whole student body is involved in the auditorium program and we have about 115 to 120 distinguished speakers throughout the year appearing here in the auditorium. Being in the Washington area we are able to draw on the highest levels of both military and the civilian part of the Government.

Most of our curriculum is carried out by means of small group activity. The student body of 180 are divided into 12 groups of 15 students each. Each of these groups then is led in small group sessions by either a faculty member or a guest seminar panelist. Each of these groups also is assigned particular areas to pursue. In the group research projects they research a particular area that we are studying, each one a different one, and then the members of the group come back and report to the whole student body.

They also use these seminar groups for the field studies of which we have two: one inside the United States and another one to foreign countries. Simulation exercises are usually staffed by student teams of different sizes and we have three different simulations. The seminars are the ones that are led by the outside experts and the case studies and the instruction/discussion sessions are led by our own faculty.

This is the overall view of our academic year and how the curriculum fits together - the core program, Courses 410 through 470 - I will tell you more about the content of these various courses later. This core program occupies the first three periods of the day. The foundation program and the elective program, as well as the workshop, are scheduled in the fourth period of the day. All students are required to take all the courses in the core program.

Selected students, based on their background and what previous study they have had, are excused from economics, management, and quantitative methods - the foundation courses. For each course from which they are excused they are required to take an additional elective program. All students are required to take at least one elective program - one elective course. Various workshops are scheduled to meet the needs of the students and they are scheduled throughout the year as the need arises in such areas as math, reading, research methodology, and speaking. This year, for the first time, the research program is optional with the student. If he elects not to do the research project, he

must take two additional elective courses. These both entail writing a short paper. As you notice, the foundation courses and the elective courses are taught on a semester basis in the same way that most colleges run their courses.

The trend in recent years has been to provide a flexible course which the individual student can shape to best satisfy his own needs. To better fulfill this we have liberalized the criteria for excusing the students from the foundation courses; we have expanded the elective courses this year for the first time, introducing half semester courses in addition; and also for the first time this year we have permitted the students to opt for the two electives instead of the research project.

And now for the content - Course 410, which is a 4-week course, concerns the policy formulation and decisionmaking environment and deals with both internal and external factors. Internally it covers the political heritage and traditions, relationships of executive, legislative, and judicial branches on local, State, as well as Federal levels, and our national goals and objectives. All sessions are issue-oriented as they are throughout the year. Externally, sessions are provided on foreign systems and objectives, U. S. foreign policy and the current international scene. The U. S. decisionmaking structure is also covered in case studies. One day of this course is devoted to a visit to the State Department and another day is devoted to a visit to Congress.

Course 420, also 4 weeks, covers the availability and distribution, development, use and conservation of basic resources. It includes human resources; such subjects as population, food, geographic and cultural factors; and natural resources: minerals, water, air, land, and energy sources. On the domestic scene periods are devoted to health, education, dissent, and minority problems. During the course each seminar group participates in a selected resource study. Some of the groups study these resources that I have mentioned and others study all of the resources in a particular area of the world.

Course 430 is a 9-week course devoted to the survey of industrial capabilities and management and industry-Government relations in the United States and abroad as they affect the security interests of the United States. It includes a look at industrial management policies, practices, controls, and decisionmaking. Also included are sessions on various functional areas of management, sessions on labor, and a look at national policies for regulation and control. Each committee is organized to study in depth a separate industry. Each member of these industry committees then reported back to a group taken from the other committees on what he had learned. One week was devoted to a 1-week field trip. One committee visited industrial concerns and governmental agencies in each of these cities. They not only had plant tours but the principal emphasis was on sitting down with top management and discussing the problems and issues related to that particular industry.

The reason it may seem so barren in the halls to you here is that the class is now on this trip.

This course also includes the first of three simulations during the year. In this management decisionmaking exercise the students form teams representing the management of a company and compete against other teams.

The exercise, as are all the simulations, is computer assisted.

Course 440, the next in the sequence, lasts 6 weeks and has as its objective to give the students an understanding of selected U. S. national security problems and the policies and commitments responsive to these problems. Areas covered are principal external threats to U. S. security; problems and policies in developing areas; alliances and commitments; alignments, insurgency, and internal defense; United Nations and Foreign Aid. In this course the committees each study a selected national security issue. These are some of the issues to be examined in depth this year with reports to be made to the whole class on each one at the end of the study. This is the remainder of the list. These issues are revised each year to ensure that they include those of the greatest significance and of most importance to the Government.

Course 450 in 4 weeks analyzes the problems and addresses the allocation of national resources. The major subject areas are: economic goals and policy formulation, fiscal and monetary policy, government policy towards industry, balance of payments, economic aid programs, and a long run outlook for the U.S. economy. During this course our second simulation is conducted. It is the world politic simulation. It serves to tie together many of the things the students have been exposed to up to this time. Team members represent the leadership of the countries included in the simulated world. These countries: the USSR, China, United States, UAR, Israel, and India interact with each other in accordance with the rules of the game.

In Course 460 in 9 weeks we examine management in the Department of Defense. Starting with the threat and the military strategy to defeat that threat, we examine, in turn, the defense requirements process, the planning, programming, and budgeting system, various functional areas such as communications and research and development, weapon selection and procurement, and the impact of science and technology and future weapon systems. This course includes our third simulation, the defense management simulation. It deals with weapons acquisition. All of the items here and more must be considered and used by the students whose teams represent project managers. The course also covers certain functional areas by means of group study projects assigned to individual seminar groups.

Course 470 is the culminating course of the year and provides an opportunity to expand the knowledge of the student as gained throughout the year. It includes a 2-week international field study for the examination of the political, economic, social scientific and military factors in other countries. These are the countries visited by the various groups last spring. The countries for this year's trips have not yet been chosen. Upon return, each group makes an in-depth report to the whole class. The final two weeks of Course 470 is devoted to auditorium presentations by distinguished speakers discussing the status of national security and estimates for the future.



Now, a bit about the horizontal courses - the ones taught on a semester basis. Economics is a graduate course covering both macroeconomic and micro-economic policies. It provides the basis and background for the student to better understand - Course 450 in the core program, National Economic Problems and Policies. The Management Course deals with management principles and their application to Defense management problems. Quantitative Methods examines the various quantitative techniques available to the Defense manager and how each may be useful in his decisionmaking.

This fall the Elective Program includes seven courses such as automatic data processing, human behavior and organization, business-Government relations, nature of modern war, planning, programming, budgeting, and financial management.

Next spring we will offer 11 full semester courses and 12 half semester courses.

Each year the curriculum as shown here undergoes certain changes. The changes, in my experience, have been evolutionary. There have to be changes to keep up with the changing environment around us - the changes in the students, the changing needs in the Department of Defense, and our changes in the curriculum reflect these other changes. There is one additional item I would like to mention in closing.

ICAF students may make application to the George Washington University under a cooperative program we have with them and gain 27 semester hours toward a Master of Science in Administration degree with concentration in administration of national security. And they do this by completing the program here. This is a 36-hour degree and they may obtain the other 9 hours by staying on through the summer for 6 weeks and completing the other 9 hours in a special course offered by George Washington University.

I realize this is a rather short look at a very extensive curriculum for 10 months and I'd be happy to answer any questions any of you have at this time.

Thank you.

## THE LIBRARY

Nancy L. Ballard  
Library Director

Fellow librarians, it is now my pleasure to welcome you to ICAF. I would like to spend just a few moments to show you how the library functions as an integral part of ICAF. Although the Resident School is the nucleus of the Industrial College we must not forget two other important schools: the Correspondence School and the Seminar School.

The Correspondence School, with an enrollment of approximately 10,000 students, has its own Textbook Development Group which has the responsibility of maintaining current textbooks.

The Seminar School has a team which conducts 2-weeks seminars in seven cities each year. These seminars cover the same subjects as those studied by the resident students during the year. The library has the responsibility of providing research and reference services for these schools.

Since the three schools are concerned with current problems, our library operates as a working one rather than historical. We try to maintain an up-to-date information service covering the subject matter of the core curriculum of the College and to provide maximum support for the horizontal courses and the thesis program.

Currently the two collections of the library, the unclassified book library and the classified document section, contain well over 125,000 items. Books, periodicals, pamphlets, reports, government publications, original manuscripts and theses and more than 15,000 security classified documents are available as source material for serious reference and research use.

The most unique section of the library's holdings is devoted to the collection of ICAF writings: the students reports, committee and project reports, and transcribed lectures that reflect the work of previous classes. This collection exists nowhere else. The research and scholarly labor it represents could not be measured.

Each class in turn can weigh the accomplishments of previous classes and then add to the accumulated knowledge in the fields covered by the curriculum.

A further service to the faculty and students is maintained by the library in its informal cooperative lending-borrowing agreements with many other special libraries in the Washington area. There are over 200 libraries representing more than 30 million potential items or sources of information. Items are located in an owning library in the area, borrowed, and then charged to the individual. ICAF can, in turn, within the limits of policy and security controls, make available its services and materials to those agencies which cooperate.

A less known but important phase of the work of the library is the preparation of the many pieces of essential and background reading that are required while in residence. During the course of a year thousands of items, books, magazines, reports, and pamphlets are secured, processed, and made available to the students and offices, all coinciding with the topic being studied.

The bibliographic reference and research facilities available in the library are implemented by a trained and experienced staff of professional librarians. Their services during the course of a year will range from the most elementary problem of locating a desired book on the shelves to the compilation of extensive bibliographies on special subjects, advice on the preparation of reports, answering reference questions which may involve personal visits to special libraries within the area, consulting known specialists in a given field, or contact with Members of Congress or their committees.

Rare materials are located and secured from local sources. Students are briefed on efficient use of the library and appointments made for them to visit other special libraries.

A survey of newly published materials in fields of interest to the College is continuously underway and the most desirable are acquired.

The technical processing activities concerned with classification and cataloging in turn, allow the book to be readily located and used. Any pile of print is in a sense a collection, but only by the library processes of organization is the chaos of recorded information made available for consultation.

The ICAF library exists not as a static collection of dusty books but as a much-used vital part of the College organization, its own vitality measured and inspired by the mission of the College, the enhancement of national security, by the knowledge of what that entails and what it means to our Nation.

### ADMINISTRATIVE REMARKS

Mr. Paul Klinefelter  
Chairman, Program Committee

Welcome to the 14th Military Librarians Workshop. Nancy, Colonel Sullivan, Captain Smith, President Oltman: We have had an excellent beginning to what I feel is going to be a very good workshop. Colonel Sullivan set the tone of the choice of program exactly in that we will look toward new problems. It is time to think toward them, plan for them, plan into them if we can.

Developing a program for a workshop like this one could have been a distinct pain and it wasn't; it was a pleasure. This depends, it turns out, on a great deal of background work that has been done for the 13 preceding workshops which saw the development of an SOP, a standing operation procedures manual, very carefully worked out and which turns out to be a great help. It provides planning guidance that need not be repeated for each workshop.

We had the willing help of the long range planning committee: La Vera Morgan, Margrett Zenich, and Bob Severance were willing to come from their various labors. In the case of Bob he came to Washington a couple of times to talk through a choice of program and what might be suitable this time. Those three are here, at least I see one of them. Can they stand up, Bob, Margrett--and is La Vera here? At least there is Bob, we have one of them.

Nancy had a program committee to help me, one from each Service: Dr. Madeleine Wilkins from the Army, Evelyn Branstetter from the Air Force, and Doris Baster from the Navy. They also were an immense help and have done everything that they could to help me out. Are those three people here? I think they are. In that case, would they stand up please.

The subject, "DOD Libraries in Transition" is an obvious one. We are in a period where there is a great deal of developmental activity, where equipment manufacturers have understood where their economic interest lies, where improvements in ADP, in processing, in microform, all the things that can help to make a military librarian's life easier are beginning now to pay off. Years of research, a great deal of investment, a great deal of requirements laid down by all of us have now produced some things that can be helpful. But it turns out that they are neither simple or in every case easy to use and that each of us is at a particular point along the way to learning to live with this new equipment, these new ways of doing things. It coincides with a new era of competition between the money that must be spent on social problems and the resources that continue to need to be spent on national defense. This will tailor somewhat the means at our disposal.

We have a great deal of electronic assistance; we have help in communications. We are able to be much more effective in the transfer of bibliographic data. Storage and retrieval, using such means as microform have become very

efficient. We have standards that have given us a common means of talking to each other, an automated lingua franca, developed by COSATI, that applies to the exchange of bibliographic data among Government organizations. We will have here some people who have worked with those standards panels. Charlie DeVore is one of the panel chairmen and has worked on Panel 1. Madeline Henderson, National Bureau of Standards, is an observer and has also done much of this work. There are others among you who have contributed a great deal.

"DOD Libraries in Transition" means looking forward in facing these problems, coming up with new solutions, and, particularly, not only stating what one would like to be able to do to face the difficulties ahead, but perhaps getting a new understanding in talking to other people who have similar problems and have found how to face them.

We will need to develop as efficient a local service as possible; we will need to get in our hands all the tools we can in the next 10 years to handle our problems locally. None of us will be able to ignore the sources of information. We may do ourselves a lot of good down-stream if we ask now for improved sources of information from DOD and elsewhere. All these things have to be thought out, and I hope that from these panels will come a good deal of solid input. This group is particularly well-qualified to suggest requirements to the Defense Department and this is a period during which DOD is likely to listen carefully.

Some workshops have produced output of great significance and it wasn't obvious immediately that this output was to be important. A case in point, the 11th workshop that was held at Wright-Patterson Air Force Base came up with a number of recommendations. One of them was that there should be retrospective indexes for the major collections in DOD because of the immense amount of reference work that was repeated day after day, asking the same questions and having to go somewhere else to ask them. One of these recommendations - that there should be such an index - got up to DOD and back down to DDC. One of my other functions is being Deputy Director of Technical Services in DDC. For the last month or two, we have been suffering through the creation of four microfilm data packages covering the 10 years of the 1960's. DDC is creating a shelf listing of all these reports and carefully formatted indexes to them to provide retrospective indexing going back through the last 10 years. This will be available in 16 mm. microfilm. This major effort was directly triggered by a recommendation of a previous military librarian's workshop. So I think we shouldn't sell short the possible effects of the recommendations of past workshops, as well as what may come from the panels that are going to deliberate in the next 2 days.

The subjects chosen for the discussion groups will be somewhat redundant intentionally. We would like to get a number of viewpoints. One tends not to be able to take a single subject and stick to that in any case. We have given points of emphasis in each case, and we have, I feel, an excellent group of chairmen. They are going to need your help. These will be joint efforts and we want to produce summary papers that the Industrial College can announce and which will have a good deal of significance. We want them to be valuable to DOD in determining its library policies in the future.

The discussion subjects of these ten groups range all the way from standardization of media to reports to DOD policy. There are some that have to do with modern techniques. Online systems, for instance, will concern a technique which is just now beginning to be used widely. In this case, there will be a good deal of explaining the process to begin with, as well as recommending useful applications for it.

The workshop session on microform has as leader one of you who has used microform very effectively, Cathryn Lyon. She has herself faced a good many of the problems that this group will discuss.

In all these cases we are not talking about what we have done; we are talking forward; we are looking toward the next 10 years. Take the word "evolution" which occurs time after time in these discussion group titles to refer to thinking forward over the next 10 years. We are not looking backward to what we have done; we are thinking about what we should do and what we should ask for in the future.

Standardization of bibliographic data, with Bob Lane of Air University as moderator, has to think about those factors that can mean better communications. Applying standards to bibliographic data will mean that cataloging can perhaps be done once and not a hundred times. Transfer of bibliographic data on mag tape is something that requires standardization. Thinking forward about techniques like these can be helpful.

Evolution of technical reports with Bud Carlson of the Navy Electronics Laboratory will take an old familiar standby, the basis of all our services, and will attack the problem of how this should evolve, how it can evolve, how it can remain useful in the next 10 years?

DOD coordination of library services with Miss O'Halloran who has come a long way from USARPAC at Fort Shafter, will debate what DOD should do to help the libraries work together - to share services when money is a problem - when we can't afford to have the same service at every facility in the same area, for instance. There will be many problems and we are looking forward to recommendations as to how coordination can better be accomplished.

The future of on line access to data banks, chaired by Joe Powers of DDC, has to consider a technique that is just now coming into its own but which may very well be a factor in all of our lives. It certainly offers a lot of promise to be able to work out reference queries with a remote source.

Economic considerations for information services in the next decade that Lt. Col. Johns of the Air Force Academy has accepted, obviously is a difficult but very interesting subject - a very pertinent one right now in that the next 10 years is perhaps going to see some strictures in our funding. We must, therefore, make the most of what we are likely to have. We need to debate how the money is to be spent, how it will be accounted for, what can be expected in the way of support, and what is recommended in the way of level of support - all these things, Lt. Col. Johns will want to talk about.

In discussing the evolution of DOD's information system - there is a great deal of redundancy with some of the other panels, but it is a subject that is very important to all of us. We want to plan; we want to ask for; we want to recommend the basis for DOD's future information system. Elizabeth Jesse of the Armed Forces Staff College, Norfolk is a good person to head this one.

Library needs in terms of suggested DOD policy, again represents some redundancy but here we can't have too many well thought-out viewpoints. Barbara Meade of DIA is going to chair this one. Suggested DOD policy can go so far as to suggest sections that should appear in an overall DOD regulation on the subject if the present ones are insufficient or if the future is going to require different DOD policies.

Evolution of the Federal information system will cover the Federal information system as opposed to a DOD system. We are part of the larger system and it is necessary that we understand it. A great deal has been done under the Office of the Science Adviser to the President to pull a Federal system together. Elements of the Federal information system which have developed independently - in FAA, NASA, AEC, and elsewhere - have been pulled together and asked to create standards, to develop joint efforts. Much is available from these joint efforts with these other agencies. We, as DOD librarians, have a right to use this work. We very often contribute more to them than we get out of them.

The future role of microform will be chaired by Cathryn Lyon of Naval Weapons Laboratory down at Dahlgren. She has worked with this a long time, has had her own storage problems, essentially solved them, and is looking into the retrieval aspects. Microform is a very promising tool of the future and one whose possibilities none of us can afford to ignore.

Dwight Lyman of the Naval Underwater Systems Center in New London has kindly consented to chair the tenth panel, Model of access to technical information. It generally concerns ways of obtaining information and attempts to look into the future as to methods of improving access.

As far as the mechanics of these workshop sessions go, I believe that each of you has on the corner of his badge the number of the session he is to go to. The excellent brochure, the "Military Librarians Workshop," that Nancy has developed gives the room number. For those of you who have trouble finding these rooms, I don't think it is very difficult, but I will ask Nancy to explain that when I get through because I am lost here and she isn't.

The format of the workshops again is that the chairmen will have three sessions. They will have one this afternoon and two tomorrow. We will have to get down to the subject pretty quickly because there isn't all that much time. You have shown yourselves in past workshops to be enthusiastic contributors so I don't worry about that. However, the chairmen will need help in taking notes, and, in the final stages of the thing, in pulling together some recommendations.

There will be an opportunity to summarize these if the chairman desires to, in our final session. The chairmen are then going to pull together reports to the Industrial College after the workshop ends so that there won't be that pressure during these two days.

This will be the true meat of the workshop. What you have developed - your ideas - will come out in these papers. This will be significant to all of us and I think to the Defense Department as well. We are planning to give till February 15 to pull together these papers. This may well involve you after the workshop is over. You may want to compare notes. The chairmen may want to draft something and send it to various of you. This is up to each group. However, try to get your ideas into it as much as you can.

We want to know what you feel is required in terms of DOD policy, organization, support, cooperative efforts and each of these subjects is intimately connected with all discussion topics. This is a working conference, its subjects are serious ones, and it is well suited to the climate of a difficult period. It demands a lot from us here and it will demand a lot from us in the future, in these years of "DOD Libraries in Transition."

This is all I have to say about the program. I would like to go on to a few special facts about this particular workshop. In the first place who every heard of weather like this in December. I predicted we could have a snowball fight out on the parade ground. But it is nice weather, you know.

It turns out that there are some people who came a long way to be with us. I don't know all of you so I would like to read some names and say where they are from and ask them to stand up. It is worthy of note that in this era when it is hard to get money to travel all of you made an effort.

In the first place we have a very healthy delegation from Canada which is something to be proud of under any circumstances. May I introduce Mr. Armand Lamirande, the Chief Librarian of the College Militaire Royal de Saint-Jean in Quebec.

Mr. Benedict Laupacis, the Chief Librarian of the Department of National Defence in Ottawa.

Mr. R. Menard, the Librarian of the Canadian Armament Research and Development Establishment Library in Quebec.

Mr. A. Ouellet, the Head, Information Services Section, Canadian Armament Research and Development Establishment Library in Quebec.

Mr. R. J. Penner, Head of the Documentation Division of Defence Scientific Information Service of the Defence Research Board in Ottawa.

And Mr. Whitlock, Unit Librarian of the Royal Roads Military College of Canada in Victoria. Mr. Whitlock may not be in this session.



I'd also like to introduce a man who has come much farther, Lieutenant HOANG NGOC HUU, of the Republic of Vietnam National Defense College, Saigon.

Some of the DOD representatives have come a long way.

Is Mrs. A. Virginia Chaney, the Staff Librarian of the U. S. Army in Alaska here?

One of our chairmen is Miss Frances M. O'Halloran of USARPAC at Fort Shafter, Hawaii.

Mrs. Margaret P. Papesch, who has been to several of our workshops, has come all the way from London, representing the European Office of Aerospace Research.

I mentioned this lady's name before but I don't want to forget to ask her to stand up. May I present the President of SLA, Miss Florine Oltman of the Air University Library.

Are there other questions about this conference, its social aspects, its program? If not, you may have some things to say. Would you like to take over and go on from here?

QUESTION: I understand you're sticky about people staying in the same choice session after session.

MR. KLINEFELTER: We felt that we should be sticky because the subjects are important and require concentrated attention.

I am sticky about it because I think that each discussion topic is going to take a lot of work from each group, and that it is going to require your concentration. I'd like not to have panel hopping. I think you, particularly, Mr. Host of SLA National Conference and so forth, should give all you can to your particular session. I would like for you to stick to it and really put out a good paper for your group.

Anything else?

MISS BALLARD: There is another reason why you shouldn't hop from group to group. The seminar rooms accommodate between 15 and 18 people. And if some of you decide to hop from group to group, it might end up that there are 25 to 30 in one group. The seminar rooms just aren't that large.

As far as the rooms are concerned, they are all on the third and fourth floors and there will be library personnel on those floors to direct you to your rooms this afternoon. The library is directly across the hall from the auditorium. I hope you will wander through and ask any questions that you desire during the period before lunch today.

## FEDERAL LIBRARY COMMITTEE

By Frank Kurt Cylke

I am especially pleased to be here today at this 14th Annual Military Librarians Workshop. During the past year many of you were very kind and helpful. You expanded my knowledge of the military and brought me many productive thoughts and information about your innovative programs.

It was no surprise, then, when I learned that the first true proponent of facsimile transmission was a military man. Yes, none other than the King of the Franks and Lombards, the Patrician of Rome, the King of the Holy Roman Empire, Charles the 1st, Charles the Great - Charlemagne - was a facsimile enthusiast.

Harold Lamb, in his popular biography, noted that Charlemagne "felt that if every monastery had its library filled there would be no need to borrow, one from the other, and perhaps lose works of which no other copy existed. Thus he had every book copied and brought to his Palace School library."<sup>1</sup>

It was a good thought then and is a good thought still.

The theme of this Workshop is "Department of Defense Libraries in Transition." It is an appropriate theme for it is a time of transition--from the old to the new--from good service to top service.

Colonel John Sullivan said in his letter to you all that problems required solving and experiences needed sharing. I concur. Indeed they do.

The question is how can problems be attacked and how can experiences be shared? The answer, to me, is through two specific vehicles: (1) an active R & D program; and (2) dissemination seminars, such as this Workshop.

I will briefly discuss these two points.

You in the military are especially fortunate! You have had two very active library-related R & D programs: (1) the Army Corps of Engineers TISA effort, and (2) the AFOSR Information Science Program. Of course, Harold Wooster and Rowena Swanson are no longer concentrating their efforts upon the theoretical and philosophical problems that are present. Margrett Zenich, however, is still fighting the good fight.

At the risk of sounding too much like a PR man for the TISA Program, I would like to run through some of what I believe are projects of great potential value.

In April, Bernie Fry (I understand his name is not a strange one to you) at the Indiana University Research Center for Library and Information Science, was given \$84,000 to pursue a state-of-the-art study which will identify all current Federal library research and evaluate it as to its objectives." The

study's purview includes information centers and information analysis centers as well as libraries.

The scope of the effort is to identify and describe all current research on Federal library and information service operations which may be:

1. Funded wholly or in part by the Federal Government which has implications for Federal libraries and information centers.
2. Investigating some aspect of problems or policies relating to Federal libraries or information service operations irrespective of source of funding.

Three roles will be pursued:

1. To develop a basis for knowing what may be possible in library and information services or in research related thereto.
2. To develop an information base to know whether or not research has been done on any particular problem that may have been identified.
3. To develop an information base to use in formulating the research designs.

This project will give direction to Federal library related library/information programs. With a little luck and some help from us all it may bring TISA, NAL, NIM, NSF, and USOE a bit closer together and eventually develop a coordinated effort.

Just last month the TISA Project awarded \$98,000 to The Institute of Library Research, University of California, Los Angeles, to pursue Phase I of a two-part research program intended to address library environmental design problems.

The aim of the funded study is to provide Federal librarians with the guidance and detailed information needed to design and execute better library buildings.

The research plan will be organized in two phases and result in three major products: (1) an evaluative state-of-the-art report on the present knowledge of library functions, elements, and techniques of design as they relate to library physical facilities and equipment, (2) a manual for evaluating the performance of components of library facilities and equipment, and for generating specifications of requirements, and (3) a demonstration model of a "guided inquiry" system for developing library building design programs.

The study currently underway at the National Academy of Public Administration by Dr. O. B. Conaway relating to the Role of the Library in the total Information System is nearly complete. When ready, it will be submitted to the FLC for action and hopefully a request will be sent to Office of Management and Budget to consider an appropriate study.

One project in the offing should interest you. As you all know, at the present time no comprehensive data base exists from which to examine Federal libraries. Thus, on June 26, 1970, the U. S. Office of Management and Budget (at the recommendation of FLC) approved implementation of a National Plan for Federal Library Statistics. The Plan, is being tested during fiscal year 1971. It will be implemented during fiscal year 1972. It has been designed to allow:

The development of factual data for use in planning and administering individual Federal library programs.

The provision of data necessary for overall planning by Federal agencies or interagency bodies.

The provision of data compatible with that collected from libraries from outside the Government so that overall figures on the status and development of library service in the United States may be compiled.

The provision of data about Federal libraries which professional organizations and individual researchers may use when conducting library studies so that Federal libraries will be considered in their conclusions and recommendations.

In 1972, then, the first comprehensive authoritative data concerning Federal library programs will become available to library administrators and others concerned with the performance of library and information programs.

This work has received input from Liz Schwartz and Jerry Coble, among others.

The National Commission on Libraries and Information Science, signed into law (P.L. 91-345) S.1519, on July 20, 1970, has definite implications for Federal libraries. Under the law the Commission is established as an independent agency with the Executive Branch. It has eight charges:

1. To advise the President and the Congress on the implementation of national policy.
2. To conduct studies, surveys, and analyses of the library and informational needs of the Nation.
3. To appraise the adequacies and deficiencies of current library and information resources and services and evaluate the effectiveness of current library and information science programs.
4. To develop overall plans for meeting national library and informational needs and for the coordination of activities at the Federal, State, and local levels, taking into consideration all of the library and informational resources of the Nation to meet those needs.

5. To be authorized to advise Federal, State, local, and private agencies regarding library and information sciences.
6. To promote research and development activities which will extend and improve the Nation's library and information-handling capability as essential links in the national communications networks.
7. To submit to the President and the Congress not later than January 31 of each year a report.
8. To make and publish such additional reports as it deems to be necessary.

All have implications for Federal library service. Charges four and five specifically mention the Federal establishment.

Work is currently underway to develop a Federal library position toward the Commission and to establish policy guidelines for practical interface between the Commission and the Federal Library Committee.

To date our efforts have been expended upon the identification of Federal library problem areas where we believe work must be expended. Eight tentative areas have been so pinpointed:

1. The role of the library in the information system must be established.
2. Administrative awareness and concern about the Federal library's role in the total information picture must be developed.
3. Administrative problems should be addressed in a coordinated manner.
4. A systematic program for gathering and interpreting information about Federal libraries must be developed.
5. A reappraisal of library services should be made to determine the appropriate placement of emphasis.
6. The place of the Federal library in research and development activity must be established.
7. The Federal library community must be brought into a close working relationship with the general community.
8. The National Advisory Commission might be asked to recommend that Congress give formal recognition by statute to the Federal Library Committee and its functions.

Next, the areas will be expanded. Suggestions will be made for appropriate attacks.

One other R & D project, not a TISA effort, comes to mind as potentially significant--the USOE supported automation project.

System Development Corporation was awarded a contract in the amount of \$119,300 to "Conduct an Analysis of Automated Federal Library Programs to the Purpose of Establishing Feasibility Criteria and as a Basis for Development of a Generalized Automated System Design."

The ultimate goal of the study is to provide the framework for the rational exploitation of automation in individual Federal libraries and, where possible, for the development of generalized and coordinated automated library systems.

Two major products will result from this work. The first is a handbook for Federal library administrators and systems analysts who have immediate, practical needs for guidelines and decision aids for analyzing, planning, implementing, managing, and evaluating automated library systems. The handbook will describe guidelines for the conduct of feasibility studies and will present resource material for systems analysis studies and for library automation projects. Flowcharts will be included for major library functions, and appendixes will present relevant, useful statistical data, as well as detailed case histories of the automation of library functions.

The second major product will be a comprehensive report summarizing the study results as they relate to planning and developing generalized compatible automated systems for Federal libraries. This report will be based on the results of both a broad survey and a selective in-depth analysis and will be supplemented by an examination of development outside Federal libraries. Addressed as it will be to those responsible for planning at the agency and interagency levels, it will interpret findings, examine important issues such as cost and the potential for common development efforts, and recommend areas in which further study can provide the most productive impact.

R & D projects are valuable only if they are read, studied in detail, and pertinent findings applied. All too often reports are placed with the clearinghouse--excuse me, NTIS--or in the ERIC system with little or no follow through. What I am suggesting today is that we heed Col. Sullivan's words.

We must search our literature.

We must exhume pertinent pieces of research.

We must bring these works to a full discussion at Workshops like this.

You may say we have examined research and the implications. I say we have not (example of major accredited library school never uses ERIC) and charge that unless we do organize a coordinated attack that Col. Sullivan's words will go unheeded and we all will be the losers.

There are two additional matters I will mention briefly before closing.

Just last week a suggestion was made that the Executive and Legislative Federal library interests join with their "Information Science" counterparts in a joint presentation to the Commission. Personally, I favor this concept.

It will permit the Commission to view the Federal information structure as a coordinated whole rather than in pieces.

<sup>1</sup>Lamb, Harold. Charlemagne. New York, Doubleday, 1954. p. 246.

#### Items of General Interest

U.S. Federal Library Committee.

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FEDERAL LIBRARY MISSION, 1966. 9p.  
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Howard, Paul, and Mrs. Marlene D. Morrissey, eds. THE FEDERAL LIBRARY COMMITTEE. "Drexel Library Quarterly," Vol. 6, Nos. 3 and 4, July and October 1970. Drexel University Graduate School of Library Science, Philadelphia, Pennsylvania 19104. \$6.00

Knight, Douglas M. and E. Shepley Nourse. LIBRARIES AT LARGE. New York, Bowker, 1969.

### MILITARY LIBRARIANS DIVISION MEETING

MISS BALLARD: In the absence of Mr. Egon Weiss from the Military Academy who is the chairman of Military Librarians Division, Mrs. Doris P. Baster will conduct this meeting this morning.

MRS. BASTER: Thank you, Nancy. Friends and associates of Egon Weiss, I'm sure you were saddened and a little apprehensive at the news of his illness. And I am sure that you join us in wishing him a speedy recovery.

Many of us had planned to get together with Egon during this meeting and firm up our plans for the year to come. Sometime during the day today we will be getting together with many of you to help us in these plans.

I'm not sure of Egon's plans for this meeting this morning. We will have to go along and hope that they follow what he had planned. I have asked Mrs. Mary Carmichael, who is our Secretary-Treasurer from the Naval Training Device Center in Orlando to give us a brief resume of the annual meeting of the Military Librarians Division in Detroit in June of last year. Mary.

MRS. CARMICHAEL: The annual business meeting was held on 8 June at the Sheridan-Cadillac Hotel. Minutes of the previous meeting were approved as printed.

The treasury showed a balance of \$1,838.36. Mr. Lane announced that Mr. Noonan could no longer publish the bulletin free of charge. There should be no problem paying for the printing providing the membership desires this.

Frances Carey reported on the 13th Annual Workshop at the Naval War College and stated that the proceedings were at the printers and distribution was anticipated by July. These were to be put into DDC for those who had not attended the meeting.

Mr. Lane received a letter from Barbara Meade of the Armed Forces Library Section of ALA requesting the consensus of opinion of MLD regarding representation of military libraries on the Federal Library Committee. She asked for comments about the proposal which would be a letter to the Secretary of Defense requesting his consideration.

After much discussion this was referred to the executive board of the division.

Thanks were extended to Mr. Leon Berg, local representative for the convention who has the distinction of being the only member of MLD in the State of Michigan.

Gifts of appreciation were presented to Mr. Berg and to Mr. Noonan for his efforts in behalf of the bulletin.

For the record right now we have \$1,772.15.



MRS. BASTER: Thank you, Mary. Our bylaws for the Division require the constitution of several standing committees. The members are appointed by the chairman. I have not been able to ascertain that these appointments have been made.

The committees that we are talking about are membership, publications, public relations, bylaws, and awards--five different committees. We need membership for the present year, 1970-71, and in about another 60 days we're going to need to think of membership on these same committees for our 1971-72 year. I would hope that sometime during the day today that those of you that would like to volunteer will seek me out and give me your names so that I may forward them to Egon. As soon as he is back at work again these committees can be constituted.

We do have one special committee and that is the Long Range Planning Committee composed of Mr. Robert Severance and Mrs. Margrett Zenich and until her retirement Miss LaVera Morgan.

Bob is here today and I've asked him to give to you all a brief report of his committee.

MR. SEVERANCE: I'll repeat a little bit because some of you may be new to workshops. The concept behind the Long Range Planning Committee is that it will examine what the workshops are like and keep its ear to the ground so we can hear from the participants as to how successful they think the workshops are to make long range plans to try to meet the needs of the librarians in the military.

Several basic concepts have pretty well been established now that should be used in workshops. One is that there needs to be broader participation than has been possible in the past, both in terms of participation at the meeting and in terms of attendance being broader than before.

You will recall that at the workshop last year in Newport my committee made a proposal that we experiment with the idea of several smaller workshops scattered around so that more people could come and the subject interest could be more concentrated. The response from the people in attendance last year was mixed to say the least. In fact there was a good deal of objection to this idea, rather that there should be one workshop each year and everybody come to the same one. This, of course, is what has occurred for 1970. The Long Range Planning Committee had a meeting after the workshop last year and agreed that we would try to seek and did get a sponsor here in Washington.

The Long Range Planning Committee did participate a little bit on the planning for this meeting. We made ourselves available as consultants and met in the early days with the sponsor. We suggested to Nancy that she might prefer to divide the responsibility by having a program committee to help her. And I think we all agree that this has been a most successful workshop. Her management of the invitations and the logistics is excellent, indeed, and the activity of the program committee and its chairman, it seems to me, has been excellent, indeed.

It seems to me this tends to prove that if you have a lot of local librarians you can divide the work and it is not so hard on any one person. This is the kind of suggestions that the committee makes.

This workshop is costing the taxpayers close to \$100,000 when you consider your pay for 3 days or more, your travel expenses, your per diem, and so on and so on. I think you can see why the Long Range Planning Committee is so concerned that it recommend workshops that really are productive. And when you try to begin to define what is productive you get into some disagreement.

The membership of the committee as the chairman elect has stated is down to two now. As the chairman I prefer to have only a three-person committee with the concept that we can invite other people to attend as needed to help us and we have done this consistently.

Right now we have no Navy representative and I had planned, of course, to have a session with Egon today about the future. I'm so sorry he is not here.

QUESTION: (Leon Burg) Well, I have a general suggestion not about your committee but more about invitations or notifications about the workshop, its dates, and so on. At my place one copy - and I believe this is probably according to your manual - one copy goes to Commander - God bless him - and one goes to the Command Librarian who is now deceased and it is a matter of chance whether the invitation gets through. So I think if we can work out perhaps by suggestions from people attending how would they like to be notified or how could we be more certain that the address will go through.

MR. SEVERANCE: The recommendation of the committee on this is that the host send a letter to the librarian of each library and to the commander or commanding officer to give encouragement to the librarian. If the commander knows about it, maybe he will be more nearly willing to let his person go. And usually the letter states - and I think yours did this year - in a nice way that we think the librarians ought to be the people who come, the professional librarians.

I think though that your point has been considered in the past and the addressing system is complicated only by lack of knowledge on the part of the committee which must make the recommendation on the attendance list of the proper address. For the last 2 or 3 years we have used the lists that were prepared by the members of my committee, each for his own Service. And as we all know, knowing about how the Service is organized for libraries, lists are not easy to get except in the Air Force. In the Air Force Mr. Cook's office has a list of every library and no problem. But in the Army this is difficult and in the Navy this is difficult. So we do have some problems. I do appreciate your calling this to my attention.

Thanks a lot.

MRS. BASTER: As Paul indicated to us yesterday, the theme of this workshop is "Libraries in Transition," and where do we go from here. So where do we go from here for our next Military Librarians Workshop?

Plans are in the making for the United States Air Force to be host for the 1971 Military Librarians Workshop with Mr. John L. Cook to be our personal host and it will be in the San Antonio area with most of the meetings held at one of the city hotels.

This will be in October of 1971. The specific dates will be worked out by Mr. Cook when he finds out the most beneficial time as far as hotel reservations and costs are concerned.

Meetings will be held in a hotel with perhaps a field trip to the School of Aviation Medicine. We also have tentative plans for the Army to be our host in 1972 and the Navy in 1973.

Egon had hoped that our newsletter would be out and available before this meeting. He has been working with Jack Noonan and Mike Costello at Picatinny. But it was determined that the publication of this newsletter would have to be commercially printed and there was a certain lag time developed because of this. Mr. Russell at the Academy assured me yesterday that the printer will furnish them to the Academy and they will be mailed to you from there in the very near future.

Because the printing costs will now come out of Division funds, it has been decided that there will only be three issues of the newsletter this professional year instead of the usual four. However, Egon will still be looking for contributions to this newsletter and anything that you have that you consider of divisionwide interest, I'm sure he would appreciate if you would draft a paragraph and furnish a photograph or whatever and send such copy to him.

We have been making plans for the 1971 convention in San Francisco. Our Division liaison officer for this 1971 conference is Miss Mary Caruso at Letterman General Hospital in San Francisco. You may be interested in knowing that the conference program chairman for this conference is Marilyn Johnson at Shell Development Company.

As far as the Military Librarians Division is concerned, we have planned two things. One will be a luncheon meeting on Monday, June 7. This will be a combination luncheon-business meeting with a speaker in a similar fashion as the 1970 conference. And on Thursday, June 10, we planned an all-day field trip to the Naval Postgraduate School. I have been in contact with Mr. George Luckett about this.

This will be a somewhat long bus trip but it is a scenic route. And I find that librarians never have a problem about finding something to talk about when they get together. It should be a pleasant trip and a pleasant tour of the facilities at Monterey. If Mr. Paul Spinks is here today I would appreciate talking to him before he leaves.

Thank you.

This concludes the extent of my planning, my thoughts on the coming year. I would like to remind you that we are looking for volunteers for these committees so that I can forward the names to Egon. And does anyone have any questions or suggestions? Yes, Paul?

MR. KLINEFELTER: I would like to express my personal appreciation for the attitude shown by John Cook and the Air Force group. They have picked up this next year's workshop with enthusiasm. There is going to be a group effort from what I understand. I'd like to call for a big hand for the Air Force in general and John Cook in particular.

MR. COOK: May I say something, please. We checked with the Air Training Command Librarian, Systems Command Librarian, Evelyn Branstetter and, of course, Louis Neighbors for Air Training Command and they checked with their librarians. They are all going to pitch in and help us to make this workshop a success in San Antonio. In my office I just have my assistant, Mrs. Daughtry, and a part-time secretary. It's more than just Headquarters U. S. Air Force.

MRS. BASTER: Good. I'm sure it will be a team effort. Any other question? I think we have about 15 minutes extra for coffee break then and we will convene for the workshop sessions at the scheduled time.

## WRAP-UP

MR. KLINEFELTER: Thank you very much for making this, to my way of thinking, an extremely successful workshop on "DOD Libraries in Transition." Events didn't lend themselves to my going from group to group to see exactly what points you raised in each of the aspects that we discussed.

The echoes I got from the discussions though were very positive ones. I mentioned once before that the positive results of a workshop very often live long after the thing is over and I have a feeling it will happen in this case. The proof of the pudding will be in the proceedings. These will include summaries - papers - representing your labors in these three sessions, three very short sessions, that you have had here. The discussion groups have shown enthusiasm and the discussion leaders have been very cooperative.

I would like to have a wrap-up. I have planned to ask each discussion leader (although sometimes these groups don't lend themselves to summarization) to come up here and summarize what happened in his session. I would like to go through that. We had a work group on "Standardization of Bibliographic Data," of which Bob Lane of Air University was the chairman. Bob?

MR. LANE: I don't know whether you are going to get the other groups up here, Paul. You gave me an hour for this, right?

I want to thank the members of my group. They were an excellent group and they pulled me through at the last minute.

Librarians have given much lip service to the need for standardization while, in fact, we have, for years, gone our own separate ways. Anyone who works in cooperative programs, for instance, is well aware of the bibliographic morass in which we work and which we have ourselves, indeed, created. While the next few years may not be our last opportunity to solve the problems of standardization, time, in the age of the computer, is against us.

Symptomatic of the crying need for standard bibliographic data formats is the example within DOD of the role of the DD 1473, that familiar form which accompanies the results of DOD-sponsored research to your libraries and was designed to provide a modicum of standard information about those documents. It was the general consensus of Group 1 that this form and its instructions are in urgent need of revision in order that they may be made newly sensitive to the changing requirements of DOD information and methods in the 1970's.

The problems of bibliographic data standardization are, as I say, formidable. This particular example is simply a cube on the iceberg. The general feeling of our group was that the recently approved National Commission on Libraries and Information Sciences can perform a most valuable service by giving top priority to the problem of standardization and to the creation of whatever administrative machinery is needed to coordinate the creation of standard bibliographic data records for all types of library materials as soon as possible. Thank you.

MR. KLINEFELTER: Thank you, Bob. Group Number 2, on the "Evolution of Technical Reports" had as its group leader, Bud Carlson of NEL. Bud.

MR. CARLSON: It has been said that only the young and the old have all the answers. Those in the middle have the questions.

After reluctantly agreeing that the future of technical reports lies in the area of microfiche, Group 2 curiously asks, "If technology can take photographs of the earth from 150 miles in space which show details of hills and dales, why can't this same technology give us a legible picture of a page at the distance of 2 feet?" Likewise if these pictures from space can be taken in color why can't microfiche be issued in color for medical, chemical, and biological subjects?

In an era of sophisticated movie projection and television viewing miracles, why can't there be a good reliable portable viewer for fiche? A personal, portable viewer might do wonders to break down user resistance to microfiche. A quicker reproduction process would also help.

In the second meeting, Group 2 went basic with the question: what is a technical report? Agreement was fairly unanimous although later reports, tech memos, tech notes, et cetera tended to crop up and cloud the issue. No one seemed to see any possibilities in the question, "How about technical reports on motion picture film, video tape, magnetic tape, et cetera?" All were agreed that the DD 1473 was used in their libraries in descriptive cataloging, but were less than positive as to the value of the subject assistance.

The question of how distribution of technical reports could be improved left the group with the impression that the originator will continue in the future to control the primary distribution of his report with a secondary distribution by DDC or GRDR. This led the group very logically to the question of why can't TAB and GRDR index reports in the same way?

So you see, since we are not brash enough to claim youth and not yet foolish enough to claim old age, we sit in the middle with our questions and hope these proceedings will be sent to the right places so that the technical report will evolve in a manner helpful to us all.

MR. KLINEFELTER: There was a work group on the "DOD Coordination of Library Services," and how this might evolve in the future. Miss O'Halloran came all the way from Hawaii to chair this and did an excellent job. She has asked Bob Severance to summarize the feelings of their panel, Bob.

MR. SEVERANCE: Now, our chairman is a real manager. She got a first class recorder who did a beautiful job from which I have made my notes. And she even got somebody else to make her speech for her.

We spent a great deal of time discussing reasons but we haven't time to give all the reasons so we are just going to give some examples. DOD libraries need to be considered as a whole in order to develop programs leading to worldwide cooperation among DOD libraries and information centers of all types. Many benefits would accrue.

Some examples are: the cooperative use of resources collections, more effective support of educational activities from the educationally disadvantaged through the most advanced professional education, cooperation in technical processing reducing useless duplication, compiling statistics to serve as a focal point for internal communication and communication with the library world outside the Department of Defense. These and many other reasons lead us to the conclusion that this can be brought about most effectively by the establishment of a DOD central office to coordinate library matters. And the group rep is going to recommend to the Industrial College that it, through proper channels, request the Federal Library Committee to prepare a position paper to present to the Secretariat for the establishment of such an office. And that copies of our recommendations go to the two professional organizations of interest to military librarians, the Military Librarians Division of SLA and the Armed Forces Librarian Section of the American Library Association.

MR. KLINEFELTER: Group IV took a technical tack in discussing the future of on-line access to data banks. I have heard a lot of expressions of interest in this. Joe Powers of DDC has chaired it for us; Joseph.

MR. POWERS: The consensus of the group dealing with on-line systems was not that they were the wave of the future but a foregone conclusion.

The question is not whether on-line systems will be used, but when and how. These questions have already been answered to a large extent by private industry and other non-Defense departments and agencies.

On-line systems accounted for about \$20 million worth of business in 1965, just about the year of their inception. Last year it was \$180 million and it is expected to range between \$1.5 billion and \$2 billion by 1975.

Other Federal departments, including the Department of Transportation, General Services Administration, The National Library of Medicine, and the Internal Revenue Service are rapidly developing their own on-line systems capabilities. IRS is presently negotiating a \$40 million contract that will include 10 CPU's and 3,7000 CRT's.

The National Aeronautics and Space Administration, as many of you know, has had extensive experience with a really good system, RECON Central. It now uses 26 terminals for 700,000 items and has expanded the system to Europe through the ESRO organization (European Space Research Operation) linking Dortmund to Brussels to Paris and later to Rome and Tel Aviv.

Within Defense we have had CIRC from FTD for intelligence data and TDMS from SDC using Command and Control Systems. As a result of the Auerbach and North American User Need Studies the Office of the Director of Research and Engineering some time ago directed the development within DDC of a prototype on-line network that could be expanded to a 50-to-100 terminal network providing both classified and unclassified service for major laboratories within the R & D community.

As a result of this program guidance a UNIVAC 1108 system was acquired and a prototype system installed. It is presently a 30 terminal system including about 20 typewriter units tied into the main system for document input processing on line, as well as 10 remote CRT units that are also used for information retrieval.

These units are now installed at ODDR&E in the Pentagon, the National Security Agency, and the Defense Documentation Center. Other terminals are scheduled to be installed at the Redstone Scientific Information Center at Redstone Arsenal, the Air Force Weapons Laboratory at Albuquerque, New Mexico, the Avionics Lab and the Materials Lab at Wright-Patterson Air Force Base. One other site is yet to be selected either at China Lake or at Fort Monmouth. Still another terminal will also be installed at NASA headquarters.

These terminals presently have access to about 700,000 technical reports at DDC, as well as about 40,000 work unit reports. In addition project planning records, sometimes referred to as DD-1634's are available, as well as the independent research and development data bank which is being developed.

A fifth data base for DOD in-house R & D resources is also available. The present cost of a secure terminal is about \$10,000 a year. For an unclassified dial-up terminal capability we expect the cost to run about \$200 to \$300 a month. This is today. By the end of the decade we expect people will be able to use an on-line system as readily as they now use their telephones. Not only for obtaining information about documents and journals, but also to obtain the particular report itself directly via the terminal if it does not already exist at the local information facility.

This is already within the state of the art on a demonstration basis. Obviously on-line systems will impact the local library. They should strengthen and improve local library operations, decrease costs, reduce redundant cataloging, and increase productivity, but more importantly provide better service.

The expansion in the use of the on-line system will depend in large measure on the proof of this thesis in actual operating libraries. It will also depend on you to a large extent to clearly state your requirements and needs to us, that they may be provided for in the system being developed.

In this respect on-line systems will not be processor-oriented, but instead user-oriented which is the way it ought to be. In this context we welcome your ideas, your criticisms, and your support.

MR. KLINEFELTER: Group V discussed "Economic Considerations for Information Services in the Next Decade." Lt. Col. Johns of the Air Academy has ably chaired this one.

LT. COL. JOHNS: I, too, had a very cooperative and brilliant group of discussants and I thank them. The interesting thing is that I don't think the conclusions are just as brilliant as the conversation was 30 minutes ago.



We decided that the really fundamental problem was how to run up-to-date libraries without money and without people and that this problem would continue to increase in the future, perhaps become even more acute in 1975 than it is right now. So that sort of undergirded the things that we had to say.

We think that microforms in some form offer some possibility of saving money - perhaps saving money and increasing efficiency. But we really didn't agree on what were the most appropriate forms for particular libraries and we had almost every kind of library represented in our particular group.

We decided that we all had to become better business managers, that we couldn't - if we have been ignoring it - we think some of us have - the business of becoming experts in fiscal administration in preparation of budgets that we have got to get better at that, that if we haven't been paying as much attention to the very technical aspects of personnel administration, then this is something we've got to do, too. Because those things tend to loom more and more important and we think this will continue into the future.

We think it is significant that no matter how hard we tried we failed to agree on what use we were going to make of computers in the future. We suspect that one of the reasons why we failed to make any conclusions here is that we just sort of played "honest injun" with each other and admitted we didn't know as much as we ought to know about computers and their applications to our individual problems. But we feel, you know, there is some hope there. The burden is to get smarter about what they can do for us.

Another agreement was that we felt that we could do more than we are doing in terms of sort of local and regional cooperation. I know out Colorado way we find ourselves - and purposely we are doing this - talking to each other more than we have been in the past to try to save money, to try to do simple things like agreeing that one of us will buy this and somebody else will buy that and somebody else will buy the other thing and then each of us will know where it is. This is an obvious way, we think, to save money. And so we are going to recommend in more detail this sort of central thought.

Finally, this is just a recommendation to John Cook. As I said I had a very energetic group and they recommended strongly that, if possible, John, a lot more lead time next year in terms of topic selection so we can do more homework.

MR. KLINEFELTER: That's a good point. We have received a number of excellent suggestions for making the workshops better as we go along. The one Lt. Col. Johns just made is a good one. There have been others. These things improve with age, it seems to me.

Group VI, "Evolution of DOD's Information System" was discussed by a group headed by Miss Elizabeth Jesse of the Armed Forces Staff College. She has asked Kathleen Carnes to report on their deliberations for her.

MRS. CARNES: Group VI recommends that there be established at the DOD level representation to provide guidance and direction in procurement functions, dissemination of policy and directives, new systems, new or changed regulations to assure a more efficient operation of DOD libraries at the working level.

MR. KLINEFELTER: That is general and we will be watching the paper to follow it for the backup and the discussions that went on in that group which I have been told reliably were intense and useful.

Group VII discussed "Library Needs in Terms of Suggested DOD Policy," and Barbara Meade of DIA chaired this and will describe it a little bit.

MRS. MEADE: I don't have much to say but I demand equal time so I used part of it to walk up here.

Our topic was quite all-inclusive with "Library Needs in Terms of Suggested DOD Policy." We felt like a second class Blue Ribbon Panel making our own Fitzhugh Report. And our charter was to forget how it is and think about how it should be. That gave us no strings at all and we could just go ahead any way we wanted. After we decided what our policy was we did.

This morning we got talking about what our needs were and we became very specific. And then we got a little argumentative saying, "That may be your need but it is not my need and I don't want a policy on that." So we kept generalizing and reducing our policy to more common terms. And if you will bear with me I will read our entire report.

In order to achieve the goals for which DOD libraries were established and to assure complete library services, we propose that a committee of professionally qualified librarians be designated to recommend DOD policy on libraries, to represent DOD on library matters, to recommend standards for DOD libraries and to transmit DOD library information.

To reflect the varied library programs in DOD, the committees should be composed of three members from each Service and from the Department of Defense representing the academic, general, and technical libraries.

As you see we all feel that we need some help somewhere. And our feeling was that by starting off with this committee, we could start any time in whatever structure we have. If we get an office within the directorate, the committee feeding in the problems and the climate of the libraries in the field could still serve a very valid purpose.

MR. KLINEFELTER: Group VIII had to do with "Evolution of the Federal Information System." I'll summarize in some detail the high points of the things we talked about because these were far-ranging discussions and the group was a very good one.

We started from the context of those things that are in being as a Federal system that have particular effect or contribution to make, such as the Federal Library Committee, the Office of the Science Adviser to the President, and the Committee on Scientific and Technical Information in that office, the National Technical Information System, Science Information Exchange, the major information processing and service-producing agencies such as NASA, AEC, ERIC, DDC, and so forth.

To this basic context of what already exists, a quick comment was that there was no good guideline to finding out these things. There were no adequate Federal listings and hierarchic structure of what exists now. We need to know who control these services, their telephone numbers and their addresses. There is not an adequate Federal guide to the information services. This is a recommendation to start with and one that wouldn't lose its value in 10 years. We need to know what is available to us now.

We then went into specific aspects. The transfer of bibliographic data is the meat and potatoes of the Federal system. If this weren't well done - weren't well organized and well funded - the Federal system wouldn't amount to a great deal. We went through the things that have already been done such as COSATI standards for the transfer of bibliographic data, parallel standards that have been developed by Project MARC in the Library of Congress for monographic data. We discussed the work that has already been done and what should continue to be done on the basis of these standards to make information readily available. Technology has become very efficient. It is poorly used; its availability and the ease of its use is not really realized or recognized. The Federal Government has a great role to play in making the use of information and the new techniques readily available, in devising adequate guidelines, and so forth.

We spoke of the aspect of Federal help in mundane aspects of libraries such as the design of a library for optimum work-flow to take into account new types of equipment - libraries designed so that users will not resist microfiche, ultrafiche, mag tape to microform, screen devices. These things are very useful; their use can be learned; they can be very effective. However, there are unnecessary constraints in library design and systems flow design, and the new techniques and equipment are unnecessarily unpopular. The Federal Government has a role in explaining this.

We spoke of the public service aspect, in that the Moss Act now exists and that each DOD library and each member of a Federal information system either already had or has now acquired pressures to perform public services. It is difficult to find a library which doesn't provide some. It is becoming more and more necessary to do so and this should be looked at positively. Each library should find ways to make its contributions palatable and useful in the local Service context.

It was brought out that many of the libraries do a great deal more in this direction than they realize in that any of them which prepare reports and send them to NTIS directly or through DDC for public release in effect feed a public service system. This is always an answer when asked what services are provided to the public particularly when asked by Congressmen.

The services based on these reports that you submit to NTIS are therefore services that you have helped to provide, so that you are contributing to the existing system for public service and should realize it.

We spoke of the desirability of a common Federal system for purchase of products and services, in that the GPO has one way of doing it, NTIS has another, coupons mean one thing in one department and one in another and there might very well be a single purchasing setup for all the Federal Government in the future, which would be a lot easier to use. This is by way of lessening irritants in library service.

We spoke of the effect of reduced funding and how equipment development might counteract it. We spoke of the general structure of the Federal system in the future and its likelihood of continuing to grow in the direction of decentralization of services so that each individual library equips itself as nearly as possible to serve all needs for its local users but depends on centralization of basic services.

We spoke of strong support for the National Commission on Libraries and Information Science. It hasn't had time to prove itself. If it shouldn't prove itself in a reasonable period, we should support some stronger organization. This could take the form of an Assistant Secretary or Secretary for Communications or any of the things that have been suggested as a good, strong peg on which to hang information and library services generally and which might do us all a lot of good. We have the National Commission; it has good potential and should be helped as much as possible.

Group IX, "The Future Role of Microform" had as its head Mrs. Microform herself, Mrs. Cathryn Lyon. I don't know that we will ever have a workshop without microform and Cathryn.

MRS. LYON: We had a good group. In fact, those 3 hours went faster than any conference that I have ever seen. I think it is because everybody cooperated.

In talking about microform in the future we talked about something that is with us right now, the problem of standardization. In this day of economic pinch libraries cannot afford to buy a piece of reading or copying equipment for every microform. We have the address - and you might like to take this down - of Mr. Donald M. Abedon of Scan Graphics Corporation in Stamford, Connecticut. He is the chairman of the Standardization Board of the National Microfilm Association. It behooves all of us to write to Mr. Abedon about the problems of standards for microform and microform equipment. We think that this is the only way that we can get to industry because COSATI can't solve the problems unless industry cooperates with them. We can get at standardization through this board that they have recently set up.

Another area in which libraries and technical information centers need cooperation of the National Microfilm Association and its industrial members is the selling job to the ultimate user. My feeling has been personally that the industrial people building equipment and furnishing fiche or microform have

not thought of the end user. If they sell us they feel they have reached the user. But we all know that we still have the problem of educating the people who come in and use our microfiche or microfilm.

One of the things we would like to see them do is to set up a serious program to educate and to outfit or equip colleges with this kind of equipment and with microfiche so that when the kids come out of college and come to work after their student days, they are already indoctrinated and we don't have this problem of crying for half an hour while we tell them, you know, how much they really must consider the use of microfiche and microform in their future.

In the course of our workshop we saw demonstrated this morning a large piece of equipment that would store and retrieve randomly 200,000 microfiche. This had the capability of an interface with a computer, it had other capabilities like fiche-to-fiche copying. Incidentally there are some brochures out on the coffee table if you're interested in looking at that. It was the Mosler Company.

We discussed AD 710-000 that came from DDC in which they tell about the research they have done on small to medium random storage and retrieval equipment. This is, I think, equipment meant to serve a program that would have 2,500 to 30,000 reports. If you don't have this it would be well, I think, to order and read what they've done through the Systems Development Corporation.

Then this afternoon the people from Houston Fearless brought the CARD which is something about the size of an ordinary reader printer, has the capability for retrieving 750 microfiche. This capability extends itself when you consider that there are anywhere from 45,000 to 73,000 frames. During the course of the day we were able to ask questions about this. In the course of our conversations we went over the possibility that DOD might require our sending camera-ready copies of reports to DDC. This is, you know, all tied in with microform in that if this is required it is possible those of us who have COM equipment may find this is the way that reports should be sent.

This recommendation was not unanimous. We had one person who withheld a unanimous vote. But generally I think we felt that military libraries should support the DOD program whereby agencies will submit their technical reports in camera ready copy to DDC and I will tell you why.

This will affect our obtaining a microfiche copy at the earliest date and eliminate our handling the receipt of hard copies on primary distribution. I don't know how many of you have that problem but it means a clerk has to check your hard copy that comes in before DDC gets it. That is something to think about.

The second thing we would like to suggest or recommend is not something that would go any higher but I think for ourselves. We wanted to recommend that military librarians take a more active part in encouraging their local authors to produce a good reproducible report. For instance, you know, to be sure that the equations are clear, to be sure that the halftones, the photographs are the kind that DDC tells us reproduce well.

It is obvious that these agencies such as DDC and NASA can only furnish good copy on fiche as incoming reports allow it.

Along with this we would like to also recommend - and maybe they are doing this, I don't know - but I suspect we may get several generations older than the second generation or so of microfiche - we would like to suggest that DDC limit the number of generations they make from one microfiche master since those of us who are interested in storing this are going to want a copy that is so good we will be able to produce as many as we need within reason.

This is the end of our discussion. Thank you.

MR. KLINEFELTER: Group X had as its subject, "Modes of Access to Technical Information," and Dwight Lyman of Naval Underwater Systems Center in New London was kind enough to chair a group this year, above and beyond...

MR. LYMAN: Participants in this group represented libraries with staffs totaling from 1 to 28. Two topics were selected for discussion during the limited time assigned to us:

1. Development of on-the-spot reference facilities using new technology such as microforms, ADP, on-line access devices and so forth.

Devices were reported which will provide quicker on-the-spot and remote access reference with a minimum of time and preservation of the original material. The device or system to be used depends on the peculiar need of the corporate user.

The decision by management concerning expenditure on machine or manpower is of highest importance. Many libraries reported entire reliance on manual operation. Reliance on central agencies such as DDC and the Library of Congress expands the scope of the individual resource.

2. Organization of services tailored to local user needs, such as automatic distribution of reference material according to user profiles.

The work unit information service of DDC was found to be used by only two of the participants. Use of these reports of work in progress should be encouraged at the outset of any new laboratory project to avoid duplication of effort. Important considerations in current awareness service are the individual's need to know and the ability to control classified material.

Recognition of management's eagerness to adopt money-saving programs is coupled with our awareness that lack of communication with management holds us back from employing the techniques and devices that will accomplish this end.

We lament the brief time scheduled for these sessions that resulted in our inability to develop many aspects growing out of the skeletal topics assigned.

We recommend for consideration to the Long Range Planning Committee that future workshops be concerned with actual instruction in various areas of library operations, perhaps by means of case studies. We also recommend consideration of a workshop theme on the subject of combination scientist-management technical information positions.

Thank you.

MR. KLINEFELTER: Thus ends a very good workshop. At the banquet this evening, we expect to have Mr. and Mrs. Christensen with us and Dr. Winnacker. If you don't know them I hope you meet them this evening. Dr. Hammer, the speaker, is brilliant, amusing and quite a guy. So I think you will enjoy that.

There is one particular thing that I wanted to do before I lost a good opportunity to do it and that is to ask for rousing applause for Nancy who has done a tremendous job, you know, an auditorium like this, rooms like this, and weather like that and so forth - Nancy Ballard has done it up well. Thank you for Nancy. And she has a few words to say.

MISS BALLARD: I just wanted to take this opportunity to thank all of you for participating in this workshop, to thank the discussion leaders and especially Mr. Paul Klinefelter and his program committee because the workshop would not have been successful had it not been for them. Thank you.

## WILL COMPUTERS TAKE OVER

Address by

Dr. Carl Hammer

Scientists the world over are facing an awesome responsibility as their work brings them ever closer to the point where drastic and possibly irreversible changes in our earthly environment are taking effect. Some of these alterations, such as in the temperature of our atmosphere or of the oceans, result from the increasing pollution which our engineering technology produces. Other changes could result from planned experiments of a global nature; these might include redistribution of the water on the surface of the earth, or an attempt to control weather and climate over cities and even continents.

The solution of these and other problems of similar magnitude will require the application of electronic computer systems to a degree which by far exceeds their seemingly miraculous powers of today. Scarcely two hundred years ago, the Swiss mathematician Leonhard Euler completed his calculation of  $\pi$  to 600 decimals and concluded this Herculean effort with the laconic remark that "it would be impossible" to extend this computation further because of the excessive amount of manpower needed. He made this statement on the basis of the technology known to him in his own time. Yet, in the past twenty years we have computed  $\pi$  first to 2,000, then to 10,000, and finally to 100,000 decimals!

For the record, the last computation took less than eight hours on one of our electronic brains, while "Uncle" Euler toiled for two years to finish his work by hand. Therefore, let us beware of attaching the label of impossibility to achievements whose implementation we can not readily foresee! After all, space travel, atomic energy, color television, and global communications, to mention just a few, were unheard of only fifty years ago but they are now an integral part of our everyday life.

The role which electronic systems hardware has played in making these accomplishments come true is basic to our understanding of the future which mankind is about to face. In order to better see the course which our electronic engineers are helping us chart, it is therefore desirable that we take an analytical look at the past and thence extrapolate forward in time.

We shall first single out man's early engineering activities which were predominantly concerned with making tools to augment his "muscle." Developments in that area are still continuing with the design of larger engines, machines, and devices to provide man with a mechanical advantage over nature--or himself. With the invention of the automobile, for example, man increased his mobility by a factor of at least one hundred; the airplane bought him another order of magnitude. Similarly, man's innate desire to conquer and control his environment gave him a leverage of about three orders of magnitude in every other area to which he applied his inventive genius. However, the laws of physics and mechanics will prevail and it is thus quite unlikely that



terrestrial transportation will ever proceed at speeds approaching those which are theoretically feasible in outer space. But even the most fantastic astronomical velocities do not exceed those that walking man can maintain by more than six orders of magnitude.

During the late thirties it became apparent that man's voracious appetite for computing power would have to be satisfied in a better way than by the then best available electro-mechanical calculators. It was also evident that such machines would have to store their own programs, or "computing recipes," so as to achieve greater speeds than could be maintained by interaction of human operators and electromechanical computers. Thus was borne, in the mind of John von Neumann, the concept of the program-stored machine, the electronic computer of today. Moreover, this machine, designed to augment his mind, gave man almost at once a leverage factor of ten thousand (with the invention of the ENIAC) and today's super computers provide us with an advantage of one-billion to-one. But we note with awe that the seemingly miraculous accomplishments of today will soon be dwarfed by new designs already on the drawing board!

We all know that the introduction of electronic computers, and more recently that of large electronic systems, has already caused profound changes in the structure and organization of our society. Large-scale business data processing without the aid of these machines has become unthinkable. Real-time systems and time-sharing make the power of the computer available to untold thousands at their desks and even in their homes. Global networks exist now which provide message and circuit switching services to an exponentially expanding circle of users. And yet, this is only the beginning; the real impact of electronic systems upon human society and the way it is structured will continue to make itself felt for decades!

Not too long ago, we completed a study to determine where future electronic systems technology will take us. Our "Technology Forecast" began with the establishment of a structured data base, using the "Delphi" technique. We asked a large number of people intimately associated with our field, what events they thought were likely to occur any time in the future. These events were then catalogued and our scientists affixed probable dates to them. Next, we obtained a statistical distribution for these dates and also determined which events had to occur prior to others. The last step is similar to the well-known management tools of PERT (Program Evaluation Review Technique) and CPM (Critical Path Method).

This study had a data base of almost one thousand events. They cover the general spectrum of systems, as well as many categories of special devices, circuits, modules, hardware in general, software, and even brainware. Our study was not planned to go beyond the electronic state-of-the-art technology; for instance, it did not address itself to the social impact which these developments might have. These aspects are sometimes lumped together under the heading of "Cybernetics" and we shall discuss them shortly. In the area of engineering technology, however, it was agreed that there will be "no surprises." The so-called breakthroughs are actually long-range developments which go through the stages of invention and innovation in a predictable manner. Cost-performance ratios tend to improve only slowly, allowing for an orderly growth process within industry and economy. In fact, if someone could design, develop,

and manufacture one of our electronic supercomputers for one Dollar, he would have the market cornered in no time. On the other hand, the same device would never "sell" for a Billion Dollars and its true value is established by our competitive technology openly and within the market place.

To give you a flavor of the things to come, and to establish a basis for discussion, we have singled out a few of the events for your consideration;

- (1) A system of national and international technical data banks will be created; it will be operational by 1980. Managers of large corporations and government agencies will have access to it via their own electronic systems; by 1985 most individual scientists will access this system through desk top devices; by 1990 it will even provide electronic language translation capabilities on an international scale.
- (2) Laboratories, as we know them today, may go out of style by 1993, as experimentation by computer simulation will be less expensive and more reliable. Laboratories will then only be used to validate the research done "on the computer."
- (3) Office and home use of computer utilities centralized on a city-wide basis will be fully accepted by 1985.
- (4) Advanced communication terminals, including graphics and some form of voice input and output, will allow many managers and professionals by 1985 to carry on their work at home, eliminating most person-to-person contacts and commuting travel as well.
- (5) Post Office services as we know them today will be almost non-existent by 1987; they will be replaced by point-to-point digital transmission of data and information.
- (6) The acceptance and use of a Universal Personal Identification Code (UPIC) for the unique identification of individuals will occur about 1980. This code, likely in the form of "voice-prints" will herald the era of a cashless and checkless society in which individuals can even be called upon to vote in "real-time" if the occasion demands it.
- (7) Micro-electronic and medical technologies will reach a point, likely by 2050, where it will be possible to directly stimulate (by implantation or other means) the appropriate areas of the human brain in order to produce sights and sounds as an aid to the blind and deaf.
- (8) Cost per operation in electronic computers will drop from current levels by a factor of 200 by 1978.
- (9) A significant increase in the use of small computers suitable for procurement by individuals will take place by 1980; they

will perform such functions as climate and lighting control in homes and offices, systematic information retrieval from various sources such as stock brokers, banks, and retailers; and scheduling of such functions as maintenance, budgeting, and medical care.

- (10) Three-dimensional color replication of living and moving objects will be technically feasible by 1981, requiring only optical devices for "sensing" by the viewer.
- (11) Speech recognition devices capable of identifying dozens of speakers using the system will be available by 1983; by 2050 computers will accept spoken input and produce audio output employing the extent of vocabulary and idiomatic usage as does an educated person.
- (12) By 1972 man-machine interactive capabilities will allow a user to examine in great detail, at various levels, and in real-time, the output results of management information reports. With this event will come the opportunity to experiment, through simulation, with overall results and plans by causing changes in variables used in projecting from the established basis and this stored information. As a result, there will accrue a greater understanding by the managerial user of the scientific methods employed to derive this information and of the effects which changes in certain variables will have in selected areas.

Notice that our list is limited to electronic engineering; it does not include predictions about accomplishments in other fields. For example, it does not reference the relatively new field of bionics, where people begin to think about the possibility that man could indeed create life and artificial intelligence. Perhaps the significance of Woehler's first organic synthesis (1826) will take on added meaning when we first create living organisms, possibly before the end of this century. What will man do then with his knowledge? Will he create a better world for himself and his heirs? Or does there exist a built-in mechanism in our species, directing us toward self-destruction and ultimate extinction?

The world of today is in a state of gross unrest, as evidenced by riots, wars, and economic upheavals everywhere. In the West, philosophers have created many magnificent fictions of perfection, beginning with Plato's Republic, through More's Utopia, Rapp's New Harmony, and Skinner's Walden Two. More recently, however, our military and political leaders have created nothing but tragic realities of imperfection. Until recently, these were but small perturbations perpetrated on an unheeding and unknowledgeable ecology. However, man's aggressions and his pollutions may constitute first-order threats to his continued existence. In their desperation, our leaders are now turning to science hoping to discover a new road to the old destination of peace and tranquility.

Scientists are of the opinion that no Utopian culture is viable. But what can we say about cybernetic cultures of the type now envisioned and made

possible by advances in the electronic state-of-the-art? We may wish to compare these two types of cultures, trying to extract from historical normative societies, psychology, management theory, and sociology necessary or sufficient constraints which appear to apply to all cybernetic cultures.

Cybernetics has been defined as the science of information processing, communication, and optimal control in complex, purposive, dynamically stable systems whose human elements provide feedback in a specified environment. While a culture, in general, is a complex self-organizing system, cybernetic cultures will be characterized by the introduction of optimizing control mechanisms which react to slowly changing values so as to produce dynamic stability. Engineers tend to think that the mere injection of computers and electronic systems into our society will produce these optimal controls. However, cyberneticists believe that the computer in itself is merely another means of gaining leverage over nature; they know that it is not really endowed with artificial intelligence! Rather, the process of optimization which will transform our separate cultures into a cybernetic society requires the hardware and software of today's computers and also the brainware supplied by their human masters. It takes very little introspection to see that we will never be able to ascribe infinite wisdom to electronic systems, no matter how complex they are; in fact, we do not even expect such performance from human beings! Advanced electronic systems now under design begin to resemble the better known hierarchical, self-organizing, organic systems with which we are more familiar. Each level in the systems hierarchy tends to optimize its own operations: the living cell struggles for life in ignorance of other cells which constitute a living body; the body fights for food, space, light and gratification of various pleasures in competition with other bodies; the species and organized societies comprised of such bodies, exhibit similar tendencies on an even larger, temporal and spatial scale. In the end, cosmologists are beginning to establish the same principle of hierarchical sub-system operation and optimization for solar systems, galaxies, and the universe.

Thus we must understand that we are in the midst of a transition from an automated to a cybernetic society. By the end of this century, electronic systems will affect or control practically every aspect of human endeavor. Every person will have then at his or her disposal a vast complex of computer services. Information utilities and data banks, for example, will make computer power available to the public in the same way that electric or other utilities today service our homes and offices. High-speed communications systems, on a global basis, will transmit data and messages almost instantaneously between any two points on earth or of colonized space. Government officials, businessmen, scientists, students, even housewives and children will "converse" with computers as readily as they now talk by telephone.

The advances in the state-of-the-art have been rapid and they have given rise to many controversies. One of them, of interest in this connection is the argument of robots versus integrated systems, with or without man in the feedback loop. For example, is it more desirable to develop completely integrated systems for outer space probes or should we emphasize manned space flight ventures? The former approach has the advantages of engineering compactness; it eliminates the need to provide artificially maintained atmospheres and living conditions for human beings. The latter approach claims that

steermanship and human decision-making processes are necessary because computers cannot yet be programmed to cope with the spectrum of all possible eventualities. The events of Apollo 11 and Luna 15 offer testimony which is hard to ignore! There is much to be said for and against either approach; however, there is little doubt that manned space travel will never be completely replaced by unmanned probes or tele-operated controls.

Generally, man is still very reluctant to entrust his fate to a machine. But as we perfect the decision-making models, more and more of the real-time processes in our society will be turned over to the machine for monitoring, reporting, and control. In most instances these models, especially in the fields of economics, planning, and scheduling are still rudimentary. But there can be no doubt that we will improve them to a point where their power or artificial intelligence will at least equal that of their human masters. Certainly the speed with which the machine can react already exceeds by far man's own response time. Soon we will begin to experiment with more sophisticated models and their ultimate adoption even in economic process control by the turn of the century seems certain.

The very structure of our society will thus change under the impact of these developments. The introduction of a universal personal identification code, mentioned earlier, may soon eliminate largely the need for physical money and usher in the much-publicized cashless and checkless society. Elaborate and universal display apparatus located in our homes will permit an untold number to "be on the job" without having to commute to offices and other places of business, thereby making travel either a matter of pleasure or of dire emergency. The very same devices will be used to display newspapers, books, or learning materials, and they may well put the stamp of obsolescence on all printed matter--or let us hope, at least on all junk mail. Computer aided training, instruction, and education will become commonplace where it is the exception now, affording everyone the advantages of higher learning.

Some day soon, electronic systems are certain to take over practically all the tasks of rote and drudgery which nature and society now impose upon us. Therefore, man must set higher goals for himself technically, politically, and psychologically or run the risk of economic and technological enslavement. It will take all of our ability, energy, and resolve to make certain that we remain masters of our own fate in the coming of this cybernetic culture. The outlook is indeed very bright if we just learn how to make intelligent use of our not-always-so-intelligent and often maligned machines.

**FINAL  
COMMITTEE  
REPORTS**

## GROUP I - "STANDARDIZATION OF BIBLIOGRAPHIC DATA"

Discussion Leader: Mr. Robert Lane

Miss Joyce L. Eakin	Mr. Dick J. Oostenink, Jr.
Mrs. Helen M. Eckard	Miss Catherine C. Rinker
Miss Charleen M. Gordon	LTJG Enie R. Saunders
Miss Olga Luchaka	Prof. Harry R. Skallerup
Miss Margaret M. Murphy	Mr. George J. Stansfield
Mrs. Dorothy Tompkins	

Librarians have given lip service to the need for Standardization, while in fact we have for years gone our separate ways. Those who work in cooperative programs are well aware of the bibliographic morass that we have created.

While the next few years may not be our last opportunity to solve the problems of standardization, time in an age of computers and long-live communication is against us.

Symptomatic of the crying need for standard bibliographic data formats is the example within DoD of the role of the DD 1473, that familiar form which accompanies the results of Defense sponsored research to your libraries and which was designed to provide a modicum of Standardized information to assist in their bibliographic control and retrieval.

It was the general consensus of Group I that this form and its instructions are in urgent need of revision in order that they may be made newly sensitive to the changing requirements of DoD information systems and methods during the next decade.

But the overall problems of Bibliographic Data Standardization are truly formidable. What is mentioned here is but a small cube on the iceberg. The general consensus of this group is that the recently approved National Commission on Libraries and Information Sciences can perform a most valuable service by giving top priority to the problem of standardization and to the creation of whatever administrative machinery is needed to coordinate the creation of standard bibliographic data records for all types of library materials in as rapid and effective fashion as possible.

## GROUP II - "EVOLUTION OF TECHNICAL REPORTS"

Discussion Leader: Irving G. Carlson

Mr. Donald J. Barrett	Mrs. M. Virginia Larkin
Mr. Leon Burg	Maj. Wanda Moore
Mr. Michael A. Costello	Miss Thelma B. Player
Mrs. Patricia H. Gipe	Mrs. Hope Smith
Miss Marie L. Koeker	Mr. Paul Spinks
Miss Orrine L. Woinowsk	

It has been said that only the young and the old have all the answers. Those in the middle have all the questions. After reluctantly agreeing that the future of technical reports lies in the area of microfiche, Group II curiously asks "If technology can take photographs of the Earth from 150 miles in space which shows details of hills and dales, why can't this same technology give us a readable picture of a page at the distance of 2 feet?"

Likewise - if these pictures from space can be reproduced in beautiful color, why can't microfiche be issued in color for medical, chemical and biological subjects? In an era of sophisticated movie projection and television viewing miracles, why can't there be a good, reliable, portable viewer for fiche? A personal, portable viewer might do wonders to break down user resistance to microfiche. In the second meeting, Group II went basic with the question "What is a technical report?" Agreement was fairly unanimous, although letter reports, technical notes, technical memoranda, etc., tended to crop up to cloud the issue. No one seemed to see any possibilities in the question "How about technical reports on motion picture film, video tape, magnetic tape, etc.?" All agreed that DD 1473 was an aid to their library in descriptive cataloging, but were less than positive on the value of the subject headings or keywords supplied,

The question - "How can the distribution of technical reports be improved?" left the group with the impression that the originator will continue to control the primary distribution of his report with a secondary distribution by DDC or CRDR. This led the group very logically to the question "Why can't TAB and CRDR index reports in exactly the same way?"

So you see, since we are not brash enough to claim youth and not yet foolish enough to claim old, we sit in the middle with our questions and hope these proceedings will be sent to the right places so that the technical report will evolve in a manner helpful to us all.



### GROUP III - "DOD COORDINATION OF LIBRARY SERVICES"

Discussion Leader: Miss Frances O'Halloran

Mrs. Nanabell W. Cooke  
Mr. Ernest DeWald  
Mrs. Dorothy Fayne  
Mr. Joseph Goldfine  
Miss Marie Hanrahan  
Mr. Herbert Holzbauer  
Mrs. Evelyn F. Jadot  
Mr. Charles R. Knapp

Mrs. Margaret N. Martin  
Miss Ruth S. Meredith  
Miss Mary Murphy  
Miss Ruby G. Porter  
Mr. Murray Rogofsky  
Mr. Robert Severance  
Mrs. Margrett B. Zenich  
Mrs. Kathryn T. Zuzick

The need for a discussion on "DOD Coordination of Library Services" stemmed from the problem of obtaining the most useful service from all libraries in each of the three services and throughout the entire Department of Defense.

The DOD is the largest operator of libraries among the executive departments, having several hundred separate libraries and over 1200 librarians at the professional level. The collections in these DOD libraries and the services available represent a major national informational resource. In organization, however, the DOD libraries vary greatly. Some DOD libraries are organized into systems with staff supervision, e.g., the U. S. Army Special Services libraries in CONUS and overseas commands. The academic and technical research libraries normally operate separately with little staff supervision. In recent years, some positive cooperation among DOD libraries has developed, but it is insufficient to meet current sophisticated demands for library services and materials.

The work session on "DOD Coordination of Library Services" discussed the need for DOD libraries to be considered as a whole in order to develop programs leading to worldwide cooperation among libraries and information centers of all types. Some of the benefits which could result are:

- Making the total library resources of all DOD libraries available to any DOD library.

- Effecting more productive library management.

- Providing cooperative services, through increased support of the military educational program, to the armed forces personnel at both ends of the educational spectrum, from the enlisted man who has been educationally disadvantaged, to the subject specialists on a scholarly level.

- Establishing DOD regional reference and research centers, and networks of information systems, interfacing the library and the information specialist functions.

- Cooperating in technical processing and support activities.
- Developing cooperative manpower resources, with due regard to the costs of training and interdisciplinary aspects of library services.
- Promoting cooperation with non-DOD library research and planning.
- Analyzing the distribution of library facilities in the armed forces and the services they provide, with the end view of strengthening them, and eliminating duplication, where necessary.
- Compiling on a continuing basis the organizational and financial requirements for DOD-wide cooperation.
- Developing continuous, two-way communication between various levels of commands; among libraries and librarians within DOD; and to other federal departments and libraries.
- Providing leadership to strengthen cooperation among DOD libraries.
- Developing unified procurement and accounting procedures for library materials to promote economy and expedite delivery.

This work group concluded that these objectives can be accomplished most effectively by the establishment of a central library office within DOD which would:

- Coordinate all DOD library and information center programs and services.
- Maintain contact with governmental, professional, and educational agencies and individuals for the interchange of ideas relating to the development of techniques and services in the communication of knowledge with particular reference to libraries and documentation.
- Represent the DOD in matters relating to federal libraries.
- Act as liaison with the librarians of the Legislative, Judicial, and Executive branches, cooperating on joint research projects for the analysis and improvement of federal library services.
- Function as the focal point for professional communications within and outside DOD for the transmission of ideas and the gathering of information relative to libraries.

Therefore, the group on "DOD Coordination of Library Services" recommends that the Federal Library Committee, through its present DOD representative, prepare a paper showing the need for such a DOD office for library and information services.

## GROUP IV - "THE FUTURE OF ON-LINE ACCESS TO DATA BANKS"

Discussion Leader: Joseph Powers

Mr. Gerald W. Beveridge	Miss Ruth A. Longhenry
Miss E. Lou Bowman	Mr. George L. Mahoney
CDR Donald P. Prady	Mrs. Marietta G. Manion
Professor Richard A. Evans	Mr. A. Ouellet
Miss Doris Hunter	1/Lt Joseph W. Price
Mr. Stanley Kalkus	Mrs. Thelma P. Robinson
Miss Eva Liberman	Miss Louise Wallace

### 1. Introduction

From experience to date with prototype on-line systems, and the extent of activity in developing operational systems for commercial as well as Federal government use, there is sufficient evidence to affirm that on-line systems will be an integral part of the Military Librarians operations. Such systems will also form a more significant part of the R&D management process--at both the laboratory and command/bureau level. This was the consensus of the Military Librarians group reviewing the future of on-line systems: that it was not a question of whether on-line systems would be the wave of the future, but rather a question of when--only a matter of time until such systems are the rule rather than the exception.

The technical feasibility of such systems has long been demonstrated. The ability of such systems to be an integral part of the decision making process, interactively and concurrently within the time frame of the decision is readily evident. The economic feasibility of such systems will be realized with their full development--not only as a retrieval tool, but also as an input device--for maintaining the data banks directly by the source of information. They will also be used as R&D management tools--to create special files and reports by the laboratories for control of projects, tasks, and work unit efforts. And in the not too distant future, such on-line systems will be used not only for obtaining information about reports, but will be used for accessing the complete report itself, the full text, either as a picture phone image or as a facsimile output at the terminal site. So this is the kind of transition expected in the decade ahead; promising, with new capabilities that will enhance the role of the military librarian and provide new opportunities for service.

The group, in evaluating this potential transition, organized its discussion around the following topics:

- Definitions
- History of On-Line Systems
- Current, Non-Defense On-Line Systems
- Defense Requirements for On-Line Systems
- The Defense RDT&E On-Line System
- Future Development

These formed the basis of the discussion and the group conclusions.

## 2. Definitions

On-line systems were defined in terms of providing direct access to a central computer and its associated data banks from remote terminal stations. The central computer facility maintains a program in core storage, sometimes referred to as a "resident controller," for serially polling the remote terminals. In effect the resident controller functions somewhat as a traffic director: identifying the terminal site, determining what data banks are to be accessed, and what functions are to be performed - either input or retrieval processing. The controller then interacts with the larger Executive or Operating System for calling the specific application programs and data banks necessary to perform the required work.

Such on-line systems are distinct from "batch" or serial processors which do only one task at a time. By exploiting the multi-programming capabilities of existing third generation computers, more than one task can be performed at the same time. An extension of this capability to use not only the hardware facilities simultaneously but the software as well is called "re-entrant programming." This permits multiple terminal users to use both hardware and software at the same time--or at least so rapidly that it gives the appearance of everything happening at the same time.

Thus the development of "re-entrant programming," "time-sharing," "multi-programming," and "dynamic core reallocation" have all contributed to a new technological capability in hardware and software that permits many library terminal users to access central computer facilities for a variety of purposes:

- Retrieval
- Input Processing
- Duplicate Checking
- Document Identification
- Reference Inquiries
- Machine-Aided Indexing
- Accountability Control

The same capability may also be used by the R&D manager--whether at the laboratory or ODDR&E level--to maintain visibility of research work in progress as well as to manage and control that work more effectively.

## 3. History

The use of computers for information transfer dates back to the late 1950's. Machinable records were made for each entry in a card catalog, and index files were used to identify documents for bibliographic listings. The first computers initially had drum memory systems, subsequently followed by core memories. All were serial, batch processors of limited capacity. These systems were followed by larger computers with multi-programming capabilities that took better advantage of the increased internal speeds by handling multiple tasks at the same time. Mass access drums and disc files made their appearance which made it possible to randomly access large volumes of data--but at a significant cost.

With the late sixties and the beginning of the seventies, a whole new technology advances which will ultimately affect our way of life as significantly as the industrial revolution, the development of electricity, modern transportation, atomic energy, or 20th century medicine. As in these other technologies, their effective use is predicated upon understanding their capabilities, their potential, and willingness to use them even tho this implies a change in our habits, our way of doing things.

#### 4. Current Non-Defense On-Line Systems

Both commercial activities and other government agencies are busy developing their own on-line networks. The General Electric/Honeywell On-Line System will link 150 cities within the next two years and eventually expand to Europe via COMSAT satellite. Major "supercenters" at Cleveland, New York, Los Angeles, Atlanta, and Kansas City will provide remote terminal users with business as well as scientific processing capabilities.

AT&T, COMSAT, and Data Transmission Corporation are all developing communication nets that will support the expanding requirements for remote, on-line processing. The time-sharing market, that was 10 million dollars in 1965, and 180 million dollars in 1969, is expected to continue its accelerated growth by a factor of ten, increasing to a 2 billion dollar market by 1975.

To take advantage of these capabilities, several Federal agencies have developed on-line systems or are in the process of doing so. The Department of Transportation has recently awarded a 1/2 million dollar contract with Westinghouse for development by 1976 of a National Highway Information and Data System linking all the Federal States to the National Highway Safety Bureau.

The Internal Revenue Service will spend about 40 million dollars for development of an on-line network linking 3,700 CRT terminals to a complex of ten central processors.

Perhaps the best known non-Defense system is that employed by NASA. Called RECON Central, approximately 700,000 document records are immediately available to 26 terminals located around the country at principle NASA laboratories. Developed by Lockheed Aircraft, the system is also being shared by AEC to retrieve their documentation, and has been expanded to Europe for use by the European Space Research Organization (ESRO), linking Dortmund to Paris, Brussels, Rome, and Tel Aviv. And so on-line systems begin to come of age, to become a practical and realistic commodity, not only to Defense organizations, but to other government activities and the commercial world as well.

#### 5. Defense Requirements for On-Line Systems

Perhaps one of the most significant directives of ODDR&E was issued in 1967 as Program Guidance to the Defense Documentation Center. Indicating the need to provide scientists and engineers with the capability to directly access Defense data banks, to "probe and search" themselves to ascertain what research has been done, ODDR&E directed DDC to develop an on-line system capable of being expanded to 150 terminals. These terminals were to be located at major Defense laboratories, prime DoD weapons system contractors, intelligence activities,

and other Federal agencies. The purpose of this network was to ensure continued superiority in the development of weapon systems--to maintain and extend that superiority that is necessary for the defense and protection of liberty here and abroad.

The guidance was in part the result of two studies sponsored earlier by ODDR&E concerning the information needs of the R&D community. These studies, referred to as the "North American and Auerbach User Need Studies," suggested two major areas requiring improvement. Their findings were based on the following factors:

- Twelve percent of all R&D tasks required completion in one week, 20 percent in two weeks or less, and nearly half in 30 days or less.

- The maximum allowable time to acquire information was less than one day for an average of 30 percent of all search inquiries, and less than one week for 50 percent of all inquiries.

- For nearly 20 percent of all tasks, information that was available but unknown was discovered too late to be useful.

- Nearly 50-60 percent of information utilized was acquired from local sources.

Thus it appeared that large, centralized information systems were not capable of effectively supplying information in the time required. Two weeks or more were required to obtain a bibliography--and in many instances information obtained was not relevant and the request had to be resubmitted if time permitted. Another week or two was required to obtain copies of the reports. Thus four to six weeks would elapse before all of the necessary information was available to complete the research or engineering task. With this performance, it was estimated that 50-75 percent of all R&D tasks were not effectively supported by existing information systems.

Recognizing the importance of the local reference library as a first and major source of all information, it was concluded that ways must be found to strengthen and improve the local library facilities--and to increase the transfer of information from centralized information centers to laboratories. To accomplish this, two major programs were developed: Selective Dissemination of Microfiche (SDM) and the On-Line System.

SDM was designed to ensure the availability of documents at the laboratory without requesting each one individually. By establishing a profile of subject or nonsubject categories (contract numbers or originating agencies) at DDG, documents could be shipped immediately upon receipt that corresponded to the desired categories. Concurrently, development of the on-line system was directed, which would compliment the SDM program by providing the tools to identify and retrieve specific reports already available at the local library. In this fashion substantial improvements in information acquisition and use could be expected in support of the research and weapons programs of the Defense Department.

## 6. The Defense RDT&E On-Line System

Within this context, ODDR&E directed DDC to develop both the SDM program and the on-line system. DDC first upgraded its computer equipment from second to third generation equipment (UNIVAC 1107 to a UNIVAC 1108 computer) with time-sharing capabilities. Over a year would elapse in converting existing programs, developing a resident controller, and proving out the Executive System. A prototype on-line system was rapidly built, however, and the first terminals were installed one year after equipment acquisition.

The first prototype configuration consisted of terminals located at the following sites;

- ODDR&E, The Pentagon
- National Security Agency, Fort Meade, Maryland
- Naval Ship Research and Development Center, Carderock, Maryland
- HQ Air Force Systems Command, Andrews AFB, Maryland

Three additional terminals were located within DDC for software development and use. The initial model was limited to retrieving data from the work unit data bank, a file consisting of approximately 40,000 records. The first model provided secure access to classified data, and utilized a keyboard CRT for interactive user/system communications. In effect the user would specify what information was wanted and the system would display the results, inform the user of any options, and generally aid the user in the search process. Associated with the CRT was a pagewriter that could be used for listing desired output--or for just keeping a log of the search.

The second prototype model provided for access to the technical report data bank, and the ability to search and identify specific accession numbers from the 750,000 documents in the collection. Inadequate mass storage, however, has precluded use of the descriptive and abstract information. In contrast to the first model's capability of displaying or printing any part of the 40,000 records, the second model did not have enough storage to accommodate any descriptive information other than the accession document number. (The development of new disc storage technology, however, at a cost half that of existing drum units, will permit the storage and display of abstracts in the near future.)

The third model is presently being developed and will be significantly different from its predecessors--and more realistically akin to the real requirements that are being defined. This model will include a different set of terminal sites, including more terminals at the laboratories (Air Force Avionics Laboratory, Air Force Weapons Laboratory, Air Force Materials Laboratory, and Redstone Arsenal). Some terminals will have classified access, and in the case of the Air Force Materials Laboratory, only unclassified access will be necessary. This will eliminate the need for costly security equipment and use of dedicated communication lines. Moreover it will provide unclassified access to the military academies, graduate schools, and technical institutes on a low cost basis. In addition, the present system model will provide for access to project planning data (DD 1634).

## 7. Future Development

DDC is in the process of summarizing its experience to date with the on-line system and defining its conceptual role in an information transfer system for the Defense Department and as it relates to other Federal information systems.

The conceptual image developing is one which accounts for diverse information needs from diverse audiences or users. Thus the needs of ODDR&E are recognizably different from that of the commands and bureaus--and these in turn are different from those at the laboratory level. In addition, the individual scientist or engineer has different requirements from the librarian--but all must be served. Accordingly, the emerging system is one of diverse capabilities, capable of handling many data banks, classified and unclassified, private and generally accessible, for input processing as well as retrieval, an aid to the manager as well as the technician and the librarian.

For the librarian, the use of terminals is visualized in the near future as something as commonplace as the telephone or typewriter. Use of terminals will eliminate the need for librarians manual searching through card catalogs and book indexes (TAB or otherwise). They will eliminate the need to recatalog documents already cataloged elsewhere. They will permit all duplicate checking, document identification, and reference inquiries to be done not only quickly--but thoroughly, not only within the Defense information system but within other Federal systems (NASA, AEC, NTIS, HEW) as well as accessing the open literature. In short, the individual librarian's grasp and scope of information availability will increase 20 times over.

And in the not too distant future, the librarian or engineer will be able not only to use the on-line system to actually scan reports and select those pages of particular interest for immediate facsimile copying at his remote site. Research presently underway at Rome Air Development Center and Redstone Arsenal using both laser and holographic technology will eventually permit storage of the complete full-text document in miniature form for immediate access for viewing or reproduction. Thus the development of an on-line system capability is not an end in itself, but merely an event, a happening along the way to improved information transfer and its full utilization in the preservation--and improvement of a free society.



GROUP V - "ECONOMIC CONSIDERATIONS FOR INFORMATION SERVICES IN THE NEXT DECADE"

Discussion Leader: Lt. Col. Claude J. Johns, Jr.

Mr. David C. Brown  
Mrs. A. Virginia Chaney  
Dr. Michael Dankewych  
Miss Jean E. Dickinson  
Mrs. Mary Jane Fabik

Mr. Thomas R. Greene  
Mrs. Ruth H. Irons  
Miss Ada E. Schwartz  
Mr. John L. Shipman  
Mrs. C. Rodney Smith

The importance of long-range planning in Department of Defense libraries will become more and more apparent in the future. Meaningful changes in organization, management, policies, and procedures require long lead times. More and more, therefore, librarians will find that creation of carefully prepared "Five-Year Plans" and even "Fifteen-Year Plans" will be essential activities of library administrators if their libraries are to serve productively as information centers in the 1980's.

Library planners must constantly bear in mind that in the future in most locations, the number of library users will increase; thus, the extent of required services will increase; and, at the same time, "information" itself is doubling every ten years! It seems clear that our present system is poorly suited to discharging these tremendously increasing responsibilities. New developments in technology and automation offer some solutions in terms of better service and the capacity to handle these problems.

The current era of austerity in the Department of Defense is definitely the pattern of the future. Thus, all libraries, particularly those dependent upon public funds, will find their most critical problem to be operating with fewer people and a fewer dollars. A paradox will clearly exist: how to increase service and at the same time reduce costs.

Automation, in various degrees, will be sought as a solution to the dilemma of reducing costs and increasing service. However, it was agreed that any change toward mechanization should be made only if that change represents an improvement in service, speed, or costs. But, everyone recognized that there were enormous problems involved. Examples include the fact that it is extremely difficult to get any reliable information relating to cost data of automation in all libraries, particularly federal libraries. And, criteria really have not been established as to what is economically feasible.

It was considered a revelation that no agreement could be reached within the group regarding the role of computers in the next five years. This failure was attributed to at least three major factors: (a) most of the participants could not contribute information from current experience in their own libraries; (b) there was a general admission that most librarians were simply

ignorant of computers and their uses; (c) there was a failure in communication between librarians and computer experts, particularly in the sense that librarians are not able to tell the "engineers" what the libraries need and, since the engineers know little about libraries, engineers are unable to tell librarians what libraries ought to have.

Local and regional cooperation will become more and more important, especially in our efforts to increase efficiency and decrease costs. For example, it seems clear that tapping into central data banks is cheaper and faster than decentralized, individual systems.

Use of microforms will necessarily increase in the next decade - to save space and dollars and to provide higher quality service in a more efficient format. However, the role of microform in information systems of the future must be intensely studied, particularly with regard to its promising integration with computer technology. A major problem associated with microform technology is that machine technology which would allow the patron quick and efficient use of microforms has not kept pace with the revolution in microforms. For example, a library of a million volumes can be stored in a 4 x 6 x 2 ft. cabinet on 4 x 6 in. transparencies with 2,000 to 3,000 pages on each, but the long-promised good, cheap projector reader (particularly a portable) is still not available.

## GROUP VI - "EVOLUTION OF DOD'S INFORMATION SYSTEM"

Discussion Leader: Miss Elizabeth Jesse

Mr. John Ashmore	Mr. Grover P. Parker
Mrs. Mary D. Carmichael	Mr. Phillip Rochlin
Mrs. Kathleen Carnes	Mr. Marvin W. Sears
Mrs. Bessie M. Daughtry	Mrs. Arlene S. Shaw
Mr. Eugene W. Hall	Mrs. Blanche Shiflett
Mr. Benedict Laupacis	Mrs. Mary Ward
Miss Cora E. Meskill	Mr. Leonard C. Weston

SUMMARY OF THE PANEL: Recommend that there be established at the DoD level representation which will provide guidance and direction in procurement functions, dissemination of policies and directives, information about new systems, new or changes in regulations and procedures which will assure a more efficient operation of DoD libraries at the working level.

This group established the premise: "What do librarians want to see in the next ten years from DoD?" This was the basis for all discussion. In order to decide what was needed, a retrospective walk was taken through the present to see what were the present problems.

They were resolved as a lack of standardization, procurement functions, noninstruction or guidance in new systems, regulations, procedures, etc.

Standardization for its own sake was not approved, as a method of disseminating and obtaining information it was considered a must. This applied particularly to methods of obtaining materials, either from commercial, G.P.O. or other agencies.

Methods suggested were for establishing with and through DDC a requirement for a controlled vocabulary which would be discipline oriented rather than mission oriented only.

Discussion concerned the need for streamlining access to DDC with revisions of Form 55 and others.

Concern was expressed as to whether the new distribution statements would be a help or hindrance in making reports accessible. Some of the panelists felt that timid authors would hide behind the limitation statement and make unnecessary restrictions.

It was recommended that the use and format of the Form 1473 and relevant forms receive firmer implementation. A suggestion favorably received was that the DDC cataloging sheet be included with each report as well as a 1473. Many felt that the terms chosen in-house were disregarded by DDC and that uniformity is needed.

Concern was also felt that library materials, particularly books and journals did not receive the same or even the necessary respect from procurement offices that shoes and ketchup do. It was recommended that DoD implement regulations to assure that books were given priority and a special category of purchase.

There was discussion about the distribution of reports from DDC as the primary source instead of secondary source. In this case it was felt that there would need to be established a selective screening board for fields of interest. There was no agreement reached and the difficulties that could be encountered if DDC accepted this responsibility, with a similar lack of internal autonomy, made for a lively discussion.

Various means of SDI were discussed. Because there was such a wide variance in the requirements of the group, this was fruitful. Among the sources were CAST, FAST, SCAN, TAB, USGRDR and other service oriented publications. The small library with only one staff member had no need for these tools. The larger libraries felt them a must. But these tools were not well known or used by many. DoD should instruct and not depend on notices from publishers for these. Particularly, the means of obtaining GPO publications, with the time lag and transfer of funds and other clerical involvements, should be abolished.

The function of the Federal Archives and the responsibility for input was also a matter of concern. The loss of valuable retrospective and uncataloged material can lose and cause harm for historical material.

SUMMARY: DoD must take a more active part in coordination of the operation of government libraries. This should be done with real workshops, not discussion groups. The smaller libraries are not informed of directives and given the help they should have. The tendency for librarians to be so personally involved with their own operation and to present a closed mind to the advances must be changed. Recognition that automation is a near and present obligation makes it imperative that all DoD librarians be kept informed and trained. The interface of one type of library with another must be emphasized.

Finally, the establishment of a DoD depository or referral center, organized along the lines of DDC and working in conjunction with DDC will solve many of the pressing problems. That there are many problems which hamper and impede the work and cause frustration is a real danger. The depository of DoD must be manned by competent, experienced working types of librarians to prevent it becoming just another bureaucracy.

GROUP VII - "LIBRARY NEEDS IN TERMS OF SUGGESTED DOD POLICY"

Discussion Leader: Mrs. Barbara Meade

Mr. Eugene G. Beary	Mrs. Rosalie O. Forst
Mrs. Ernestine D. Bell	Mrs. Catherine R. Hetrick
Mrs. Ann R. Clark	LT HOANG NGOC HUU
Mr. John L. Cook	Miss Florine Oltman
Mrs. Kathryn M. Crawford	Miss Ingjerd O. Omdahl
Miss Virginia E. Eckel	Prof. Earl R. Schwass
Miss Aileen V. Ellis	Mrs. Alreeta Viehdorfer
Mr. Raymond Yamachika	

THE COMMITTEE: Committee Members were assigned in accordance with interests they had declared prior to the workshop. Not all members attended all sessions and some observers sat in on some of the meetings.

DISCUSSION TOPICS: Members of the committee randomly suggested topics on which DoD policy might be considered necessary:

- Complete library services to meet mission requirements
- Resources to meet at least minimum standards
- An advisory committee of librarians
- Communications and dissemination
- Possibilities of union catalogs or shared data banks
- Interlibrary cooperation, reference sources
- Management of resources with all library activities at a single installation under one manager
- Support the interaction of libraries
- Placement of the library within its organization and professional status of librarians
- Information science and (or versus) libraries

THE DISCUSSION: There was a marked unease on the part of members who felt they were in a favorable situation with funds, status, organizational status and policies responsive to their needs. They seemed to fear that any policy making from DoD would only downgrade the quality of the work and the working conditions which they now enjoy.

As each topic was defined and preliminary statements were made, it became the consensus of the committee that they could not recommend specific policies. The heart of the problem is the lack of a channel from all the libraries to a focal point within DoD. As the discussion went deeper the deliberations of the committee produced a single recommendation which would provide a vehicle for informed policy making, a communication channel, and a sharing of professional expertise.

THE RECOMMENDATION: In order to achieve the goals for which Department of Defense libraries were established and to assure complete library services, we propose a committee of professionally qualified librarians be designated to recommend DoD policy on libraries, to represent DoD on library matters, to recommend standards for DoD libraries, and to transmit DoD library information. To reflect the varied programs within DoD, the committee should be composed of three members each from the Army, Navy, Air Force and Department of Defense to represent the academic, general and technical libraries.

## GROUP VIII - "EVOLUTION OF THE FEDERAL INFORMATION SYSTEM"

Discussion Leader: Paul Klinefelter

Mrs. Margaret Barr	Mrs. Madeline Berry Henderson
Mr. John Berry	Mrs. Margaret P. Papesch
Mrs. Edna R. Rowman	Lt. Col. Wilmer E. Reid
Miss Frances L. Carey	Miss Josephine Sullivan
Mrs. Cleo S. Cason	Mr. George K. Vrooman
Mr. Walter B. Greenwood	Mrs. Sylvia J. Webber

The federal information system in the context of the interests of this Workshop was described as the aggregate effort of the various Federal agencies in the scientific and technical information field. It includes the DoD information system discussed by Panel VI. Initial panel discussion summarized briefly the status of the federal information system and went on to developmental possibilities and requirements for the next decade.

The elements of the federal system were reviewed briefly along with their relationship to DoD libraries as sources of information and service. Prominent among the discussions were the chief service centers used by DoD libraries; i.e., the Defense Documentation Center (DDC), the National Technical Information Service (NTIS) for publicly-releasable items stemming both from DoD and other federal agencies, the National Library of Medicine whose MEDLARS project and Index Medicus provide direct support to many DoD library efforts, the Department of Transportation, NASA, AEC, ERIC, and so forth.

One important aspect of the federal information system which contributes to future ease of communication was described as the extensive program to develop standards which make for reliable, quick and cost-effective bibliographic service. Most of this work to date has been done in the framework of the Committee on Scientific and Technical Information (COSATI) under the aegis of the Office of the Science Advisor to the President. Successful and widely used standards have already been developed in such key areas as descriptive cataloging, microfiche, report format, transfer of bibliographic data on magnetic tape, subject terminology development and subject classification. These efforts are continuing and the development of library services for the next decade has been made much easier because these standards allow effective communication of information in standard formats which obviate the repetitive redescription and recataloging from one library to another that has been typical of the past. These standards in the areas of microform and magnetic tape can now be expected to concentrate the developmental efforts of major equipment manufacturers; their progress should be faster because the basic data will have been standardized.

The role of the Federal Library Committee (Executive Secretary, Mr. Frank Kurt Cylke) was discussed as to its mission, its composition and its possible contribution to the future coordination of federal efforts in the information field.

Some specific research and development efforts of importance to DoD libraries were analyzed. A case in point is the current Army funded study being carried out by the University of Indiana to develop new and more effective equipment and techniques for libraries. This contract (DACA73-70-C-0005) has unusual breadth and should produce useful results.

The discussions addressed the question "What does the federal information system need to be more effective in the future?" Among the suggestions brought up were the following:

- Because one of the chief library problems has come to be that of storage efficiency when the amount of documents to be stored has become so large, storage in microform has to be considered. Microfiche has many advantages and also certain drawbacks. It probably will be increasingly necessary to use some form of microstorage as the size of collections increase. Its undesirable characteristics as seen by library patrons who dislike reading from viewing screens or miss having a portable paper copy or are accustomed to making marginal notes in personal copies can be minimized by planned user education, user area design for ease of viewing microform, ready availability of information in microform, effective copying facilities, and taking advantage of equipment improvements which can provide larger and more legible screens for viewing, portable viewers with good legibility and so forth. Current knowledge of what is available, as well as group and/or individual efforts to push for improvement in new microform equipment, is important.

- The importance of the various federal standards was emphasized and the matter of obtaining copies of these standards was brought up. A listing of those COSATI standards available from NTIS is attached. Examples of the value of standardization were discussed; i.e., cataloging of DoD documents done at DDC is not repeated when these same documents are reannounced in the NASA STAR Bulletin. Instead DDC input is obtained by NASA in magnetic tape form and used directly. Similar unidirectional and bilateral exchange arrangements are under study with other agencies. The COSATI standard covering the transfer of bibliographic data on magnetic tape now provides for two standard computer programs and a common data transfer format. Any participating agency needs, therefore, to write only two programs, one to convert its own data to the common format and the other to convert for its use the common format for data from any other participating agency. Descriptive cataloging standardization has meant that the concept of one-time cataloging at the source is becoming a reality with all attendant cost savings. This is being reflected in descriptive data prepared for a report at the time of its creation, entered on the Form 1473 bound in the report, used and stored by federal documentation centers like DDC and NTIS, and furnished to other agencies in the form of indexes, announcement bulletins, magnetic tape and so forth for use in all data transmission and bibliographic service activities. This shared effort based on standardization will become increasingly important in the future. Work on COSATI microfiche standards needs to be extended to cover such new concepts as ultrafiche and color fiche.



- Improvements need to be made in the design of libraries to handle modern equipment and documentation procedures. Federal help and guidance are needed in the design of library facilities to increase the effectiveness of the use of microform, on-line systems, CRT viewing screens of all types, remote terminals for data input and so forth in order to update existing library facilities and to design future bibliographic service facilities in the Department of Defense. As a part of this assistance, optimum flow patterns for library services of varying user volumes would be useful in the planning and utilization of facilities and materials to the best advantage.

- It is typical of the federal information system, as it exists, that there are being set up more and more specialized centers for specific subjects. The information about these centers and access to their services needs to be widely available to all DoD libraries, and this information should be kept current as these sources of specialized information with the federal information system change and evolve.

- Policy guidelines for library services will be needed. As a case in point, DoD libraries generally serve a closed system comprised of the various facilities and activities of the Defense Department. However, in each service situation DoD librarians find themselves, to one degree or another, involved with service to local businesses, charities and to the general public. The trend to this broadening of DoD library services continues to grow under the influence of such legislation as the Moss Act. This is a logical and desirable use of DoD library facilities to the degree that it can be justified over and above the assigned mission of each library within DoD. Particularly in that DoD librarians often have something to gain from this process as they must depend on services outside of DoD in the federal system and among public information sources to satisfy many DoD information requirements. This can sometimes build up a useful exchange of services. In the particular case of NTIS in the Department of Commerce this center has been set up specifically to provide report copies and bibliographic data stemming from federal agencies, such as DoD, NASA, AEC and so forth, to the public. DoD libraries in activities which produce technical reports therefore, are often already contributing major services and materials suitable for public purposes through the medium authorized by the Federal Government. This is a point to be kept in mind in answering questions as to the responsiveness of DoD libraries to public needs.

- The Federal Library Committee has been set up as a means of coordinating the disparate information efforts and services within the Federal Government. It is an advisory body only and depends for support on the Library of Congress, but its usefulness and authority can grow in an era when services of all types, including those of library systems, are generally being decentralized and more coordination is needed. On the point of decentralization, the trend will probably continue to provide effective centralized sources of information in the respective federal agencies, but to attempt to place in the hands of local services all possible reference capability so that a majority of the bibliographic service required in any specific area can be effected locally.

- The trend to charging for bibliographic services is likely to continue. This makes for increased bookkeeping responsibilities, different funding allocations and careful attention to ordering procedures and the timeliness of services from centralized sources. It can be expected that more and more service from such centers as DDC and NTIS will call for charges, and because of this, increasing attention will have to be paid to the real necessity of any product or service requested by a user. The capabilities and knowledge of librarians throughout the DoD system, as well as the federal system, will have to enlarge to guide and make more effective the service they provide as these services become more expensive. Librarians will need planning ability to build up local service to the point that they will need to obtain from other sources only that information which they must have to satisfy a priority request or to build up overall reference capability. Exchange of information will become more and more important. This decentralization will call for more effective reference capabilities; i.e., information not only as to a library's own holdings but where else useful information can be found. The National Referral Center in the Library of Congress has made a good beginning, the Science Information Exchange in the area of publicly available research-in-progress data has made another, and DDC not only prepares bibliographies in answer to questions but also includes other sources of pertinent information.

- Some sources of generally useful information for federal librarians have appeared and more are needed. One of these is a COSATI publication called "Selected Mechanized Scientific and Technical Information Systems" which was published in 1968 and which will be reissued this year. This publication gives detailed information about 10 automated federal information activities, and the new edition will describe 35 systems. Another good reference tool is "Resources of Federal Libraries Maintaining Extensive or Unique Collections of Research Materials" published by the Biological Communications Project of George Washington University in September 1970.

- One of the promising areas for future library development is the use of on-line data retrieval systems. These devices offer possibilities of more effective service for less money and less personnel, but they require investment and personnel training. Some existing experiments in the use of reference service based on CRT screen equipment were outlined, including the remote terminals hooked up to a DDC system and the widespread use of the RECON system as used by NASA and other agencies. It was pointed out that more and more data banks and information resources are being stored for availability in this way, and that the telephone lines which are so far the most common means of hooking up remote reference sites to the federal systems have not proven to be prohibitively expensive. DoD librarians should be aware of developments in this field and the possibility of using equipment of this type in any plans for system evolution and facility redesign.

- The next decade will require improved indexes, specialized bibliographies, subject profile dissemination of information, listings of specialized holdings and so forth. One recent step forward in this area has been the exhaustive set of retrospective indexes on 16mm microfilm prepared by DDC to cover the 10-year period of announcement of its holdings from 1960-1970. These indexes have long been needed, and stem from the recommendations of a former Military Librarians

Workshop. They are organized for effective retrieval (two sections, one containing classified and limited material, the other publicly releasable material, with each section broken into two five year subsections for 1960-1964 and 1965-1969 and based on listings of complete bibliographic entries in accession number order, supported by comprehensive indexes in the present-day TAB index format). This microfilm index package, which is being released at a reasonable cost considering the very large amount of data covered, may well be the first of many similar efforts to place in the hands of local library facilities the means for making most of their own bibliographic searches without having to go to other sources. DoD librarians should push for easily available information of this type throughout the federal system.

- The group strongly recommended for the future that there should be a standardization of pricing and particularly of the forms and procedures used to obtain technical information from federal sources, in order to make the heavy paperwork responsibilities of DoD librarians as simple as possible and to facilitate their budget preparation responsibilities. It might be desirable for GPO, for instance, to establish a common means of exchange to be used by all federal agencies to procure information services and media.

- The question of complete regional depositories of information within the federal system as opposed to a single major source in Washington or some other central point requires review. Such agencies as AEC and NSF have experimented with the creation of local depositories but the feedback from these experiments has not produced clear-cut recommendations.

- It was recommended that the DoD library groups, and the federal library community generally, support the newly-established National Committee on Libraries and Information Sciences in order to give this group as great an opportunity as possible to prove its usefulness. It is hoped that a positive contribution will materialize, and either that this Committee will develop into a strong source of support for the library community or that it will serve as an intermediate step to some stronger body such as a formal Department of Communication.

- Federal financial support is needed in training and cross-training librarians in the area of information storage and retrieval developments and communications media, just as on-the-job training and education is frequently provided to scientists to advance and modernize educational background. Librarians in the context of the federal information system find themselves obliged, in order to maintain the effectiveness of their services, to be able to use, understand and improve a wide range of sophisticated new procedures and equipment. This requires reeducation and training possibilities of an order that will need federal coordination and support.

- Federal libraries are evolving in many ways into transfer points and sources of expertise for specialized information. The needs for library services are increasing, funding support is likely to remain static or even to decrease and the nature of library services will be forced to evolve. Means of using centralized services to accomplish the old standard practices of cataloging and classification will be needed in order to free librarians for this increase in the collection and organization of information from many sources.

**COSATI PUBLICATIONS AVAILABLE FROM THE  
NATIONAL TECHNICAL INFORMATION SERVICE**

- PB 193 340    Compilation of Terms in Information Sciences Technology, ed. by Florence B. Casey, for Panel on Information Sciences Tech., Comm. on Scientific and Technical Information (COSATI) April 1970, 474 p. (COSATI-70-4)
- PB 175 618    The Copyright Law as it Relates to National Information Systems and National Programs: A Study by the National Information Systems. July 1967. 82p.
- PB 188 880    COSATI Inventory of Information Science Technology. Reports of Federally-Funded Research and Development Projects in the Information Sciences, FY 1968. Information General Corp., Palo Alto, California. May 1969. 2200p. Available only in microfiche \$12.00.
- AD 612 200    COSATI Subject Category List. Dec. 1964.
- AD 624 000    COSATI Subject Category List (DoD Modified). Oct. 1965.
- PB 177 050    Directory of Federally Supported Information Analysis Centers, April 1968, 196p. Federal Council for Science and Technology, Washington, D.C. (COSATI).
- PB 189 300    Directory of Federally Supported Information Analysis Centers. Jan. 1970, 79p. Sponsored by Panel 6, Information Analysis and Data Centers (COSATI). (COSATI-70-1).
- PB 175 725    Federal Microfiche Grid. Dec. 1965, 1p. Federal Council for Science and Technology, Washington, D.C. (COSATI)
- PB 167 630    Federal Microfiche Standards. 2nd Ed. Dec. 1965. 19p.
- PB 180 600    Guidelines to Format Standards for Scientific and Technical Reports Prepared by or for the Federal Government. Dec. 1968. Panel on Operational Techniques and Systems (COSATI). 16p.
- PB 177 051    Proceedings of the Forum of Federally Supported Information Analysis Centers, 7-8 November 1967. 1968. 72p. Sponsored by Panel 6, Information Analysis and Data Centers (COSATI)
- PB 193 386    Progress in Scientific and Technical Communications, 1969, Committee on Scientific and Technical Information, 166p. (COSATI-70-3).
- PB 186 400    Progress in Scientific and Technical Communications, 1968. 99p. Committee on Scientific and Technical Information (COSATI-69-5)

- PB 180 867 Progress of the United States Government in Scientific and Technical Communication. 1967. 106p. Federal Council for Science and Technology (COSATI).
- PB 176 535 Progress of (same as above). 1966. 39p.
- PB 173 510 Progress of (same as above). 1965. 48p.
- PB 168 267 Recommendations for National Document Handling Systems in Science and Technology. Nov. 1965. 608p. (The SDC Report)
- PB 173 314 Standard for Descriptive Cataloging of Government Scientific and Technical Reports. Rev. No. 1. Oct. 1966. 54p.
- PB 181 541 Status Report on Scientific and Technical Information in the Federal Government. June 18, 1963, 18p.
- PB 179 658 Selected Mechanized Scientific and Technical Information Systems. April 1968, First Ed. 140p. Prepared under sponsorship of COSATI. Available from GPO paper copy \$1.25 or NTIS in Microfiche \$0.65.
- AD 670 606 Study of Scientific & Technical Data Activities in the United States. Vol. I Plan for Study & Implementation of National Data System Concepts. 30 Apr. 68. 266p. Science Communication, Inc. (Sponsored by COSATI). (COSATI-69-1).
- AD 670 607 Study of (same as above). Vol. II. Preliminary Census of Scientific and Technical Data Activities - Parts A and B. Dec. 1968. 433p. (COSATI-69-2).
- AD 670 608 Study of (same as above) Vol. II. Part C. Dec. 1968. 489p.
- PB 174 249 System Study of Abstracting and Indexing in the United States. 16 Dec. 66. 235p.

All reports listed above are available in paper copy at \$3.00 each or in microfiche at 65 cents each. PREPAYMENT IS REQUIRED. Document stock numbers must be included with orders to insure prompt service. Make check or money order payable to: National Technical Information Service. Mail to:

National Technical Information Service  
U. S. Department of Commerce  
Springfield, Virginia 22151

The following documents are available from Government Printing Office.:

Guidelines for the Development of Information Retrieval Thesauri. 1967. 9p. Available from GPO, \$0.15; shelf no. Y3.F31/16:8IN3.

Selected Mechanized Scientific and Technical Information Systems. Apr. 1968, First Ed. 140p. Prepared under sponsorship of COSATI. Available from GPO \$1.25 Order No. Y3.F 31/16:2M46 or National Technical Information Service in microfiche only as PB 179 658 for \$0.65.

## GROUP IX - "THE FUTURE ROLE OF MICROFORM"

Discussion Leader: Mrs. Cathryn C. Lyon

Mrs. Mercedes Bailey	Mr. Armand Lamirande
Miss Mathilde Carter	Mr. Robert L. Messinger
Mrs. Margaret L. Gallagher	Mr. John J. Nicolaus
Mrs. Caroline Gheblian	Mr. R. J. Penner
Capt. Benjamin C. Glidden	Miss Autha Janelle Scoggin
Mrs. Wilma Ruth Harris	Mr. Jack C. Ward
Miss Claudia Jakobeit	Mrs. Patricia W. Wittgruber

To start the discussion, preliminary remarks were made by the Chairman as a base of workshop discussions.

Statistics produced by the National Microfilm Association show that the industry grew from a base of 2 million dollars in 1957 to 29 million in 1967. The projection for 1967-1977 is 245 million and 1980, 390 million. Putting it another way - the field grew by 1000 %/o from 1960-1970 and 1000 %/o is projected for 1970-1980.

Those of us who are already deep in microform and those looking toward its usage know that any growth in one area such as microform is bound to produce all sorts and sizes of equipment. Standardization of microform and its equipment will be the economic concern for users as well as the efficiency of these items. Standards need to be set at the industrial level and held to them by the industry policing itself.

The National Microfilm Association has appointed a Standards Board with the objective of acting as a coordinating body of volunteer standardization. They will promote interchangeability and improvement of products.

The NMA has appointed Mr. Donald M. Avedon of Scan Graphics Corporation in Stamford, Connecticut. The group urges that all military librarians communicate what they consider problems or suggestions for improvement to Mr. Avedon.

Another problem we felt was the responsibility of industry for educating the ultimate users. Industry appears to consider that they have sold the user if they have put equipment in the library or information center. We believe that they (industry) should be alerted to their responsibility for orienting scientists and engineers or any final user. It was suggested that somewhere in HEW, possibly Dr. Lee Burchinal's office, might be interested in subsidizing a program of education in colleges through industry. The idea could be that industry would see that colleges had equipment and microform for regular use by students. By the time they are job ready, microform could be completely familiar. Costs of hard copy and user resistance to microform create a time consuming problem for information and library centers. It is found generally that spending an hour or so with the user usually develops his acceptance. However, few librarians have that much time to spend on one factor.

In discussing quality of microform, the group recognized that the original copy must be good or results are poor. It was suggested at the workshop wrap-up that libraries keep in constant touch with their publication departments to keep the original reports adequate for photographing. This involves clear equations, half-tones and good graphs.

Quality problems involved;

- Curling microfiche (hard to file)
- Poor graphics
- Illustrations were placed inconveniently in reports and should appear closer to the referenced portion of the text
- Lack of standardization in side selection for copying
- Blue microfiche is usually of inconsistent density
- Loss of quality in reproducing microfiche
- Lack of scan/zoom capabilities for readers

In respect to negative and positive microfilm, the choice appeared to be for negative. Reading against the light background of the position was objectionable.

The size or kind of microform for use depends upon the nature of the collection to be photographed. Little used records most certainly should be stored on microfilm. Active documents and records are more efficient for retrieval as well as changes on microfiche. There are ways of changing microfiche. One can be done by using a stripped master that can have sections cut and reinstated. The master looks like the cut outs we used to make in kindergarten. One can photograph on microfilm and stuff it in transparent sheets or strip the microfilm by adhesives to the transparent sheet. Microfilm can be spliced but one should investigate individual methods for updating it that may be developed at a local situation. In the mill are some possibilities of equipment for picking up frames from various fiche to make a new document. Colored microfiche is now available but its use can be expensive. If the capability to pick up and add frames one at a time comes about, a colored frame might be used for depicting items that need color for understanding.

During the course of the workshop, equipment for random storage and retrieval was discussed. The Image System CARD which holds 750 microfiche (45,000 - 73,000 frames) and has a keyboard for records retrieval; the small to medium equipment that will hold from 2,500-30,000 as proposed to DDC by the Systems Development Company; systems of larger capacity like the Sanders-Diebold, Remote Console Information Corporation, Eastman Kodak Miracode, and the Mosler 410 were discussed. The Image System people kindly brought a CARD to the workshop and gave a demonstration of possibilities for a small collection. The group suggested that internal reports of agencies, correspondence of division, special data bank assignments could be among the applications. The DDC and other mentioned have use for small libraries to large information centers.

At the Mosler demonstration we learned that 200,000 fiche can be stored at once. By a greater reduction this capacity can be increased. Equipment of this size can become a central depository for all agency data banks. A terminal can be placed at each data bank headquarters and the user, by keying, can receive immediate information. The library could of course place its collection in the equipment and monitor the data banks, i.e., input, output, etc.

Opinions were presented about readers and reader/printers. A large user had placed Bell and Howell Mascots with every 4/5 persons with the librarian keeping circulation records. In one case the Bell and Howell Executive had been placed in various departments and it was left to them to maintain and pay for the equipment. The DASA of the Office of Education was described as well as the new book size portable reader by Micro Display. The latter has a scan/zone capability from 20x40 making it usable for super fiche.

The experience of the group indicated that users were requiring a smaller reader that will be a permanent fixture on their desks. In order to make microfiche and microfilm attractive, it behooves the library or information center to examine its program and keep abreast of new equipment developments.

For libraries who are considering microfiching a large part of their collection, it was suggested that they contact their various service publication departments. For instance, the Navy Publications and Printing Service Office in Washington is able to do microfiche photography at a reasonable rate. Microfiche cameras are expensive and unless an agency is routinely doing a large quantity of reproduction, it is cheaper to have it done in a photographic center.

Those of the group who were not on automatic distribution of microfiche from DDC expressed a desire to participate. One of the problems in this connection is the receipt of hard copies from the distributor. These then have to be checked against the microfiche holdings and pitched if microfiche is on hand. Such duplicate handling takes much clerical time. This led to a proposal that librarians support the program in DOD which will put camera-ready copies in DDC. DDC will then make primary distribution on microfiche and eliminate the hard copy duplication. It is hoped that DDC will be able to distribute microfiche at as early a date as hard copy is presently.

It was a pleasure to have our Canadian friends attend the workshop and trust that they derived some valuable information.



GROUP X - "MODES OF ACCESS TO TECHNICAL INFORMATION"

Discussion Leader: Dwight C. Lyman

Mrs. Grace M. Furney	Miss Nancy J. Padlon
LCDR Herbert L. Hoppe	Miss Estelle Phillips
Mr. Anthony F. McGraw	Mr. John E. Rosenberg
LTC Harold L. Mason	Mrs. Charlotte Sait
Mr. R. Menard	Miss Margaret B. Thornton
Miss Marie T. O'Mara	Mr. Charles Waterman

Participants represented a cross section of DOD libraries - large and small, technical, school, research - and at all stages of automation.

In keeping with the theme of this years Workshop, transition, we were fortunate in having a representative from Defense Documentation Center who outlined the various projects and services both in the experimental stage and on the planning board. Hopefully, DDC will prove a strong catalyst in this transition movement.

The two topics selected were developed by informal reporting of the current situation within the participants libraries. Of outstanding note are the following:

1. Development of on-the-spot reference facilities using new technology such as microforms, ADP, on-line, etc.
  - a. Edgewood Arsenal, Maryland, Technical Library Branch reported the installation of the Mosler Information System Model 30 which uses 400,000 fiche notched, coded, retrievable automatically through a cherry picker, display capacity, capable of producing hardcopy on the spot, but with no computer interface. There were remote access terminals where documents could be retrieved using AD number.
  - b. Canadian Armament Research and Development Establishment Library, Quebec, received fiche from DDC and from DSIS (Defense Scientific Information Service). Their fiche collection totalled about 250 and they had the reproduction facilities for filming their own fiche and for producing copies.
  - c. Naval Submarine Medical Research Center, New London relied very heavily on the DDC fiche. They could reproduce fiche and had a 3M400 Reader-Printer.

- d. Air University Library, Maxwell Air Force Base, had most of its periodicals on microfilm, however their patrons would not use the film and they had to print out quite a lot. Anything over 10 pages was ordered from DDC.
- e. Harry Diamond Laboratories, Washington, D. C., had many automated services and used a lot of fiche. They bought the tapes from DDC for 1,000 dollars a year, had Physics Abstracts, IEEE Abstracts, and Engineering Index on tape also. They stored their fiche in a Diebold. From the new tapes they would produce a Purchase Guide that would ask the patrons what they want to have bought for them. (Their SDI system will be discussed in the next topic).
- f. Defense Documentation Center.
  - (1) Compact Automatic Retrieval Device (CARD) was given a trial run. This is a TV size carousel that can store 50,000-70,000 fiche and retrieve them in 1/2 minute. There is a magnetic strip along the top of the fiche so that they can be automatically retrieved.
  - (2) UNIVAC 1108 is the "Thing" now. This provides on-line capability for a four level search but retrieval can only be done by AD number and there is as yet no way of portraying an abstract of the document. There are 5 remote access terminals to date.

General -- all members used TAB and microfiche, but in varying degrees.

- (3) Defense R&D of 60's - shelflist on 16mm film of all 1959-60 documents; approximately 110 reels. They used COM equipment (Computer Output on Microfilm) to produce this.
- 2. Organization of services tailored to local user needs, such as automated distribution of reference material according to user profile.
  - a. Air University Library, Maxwell AFB employed the IBM Magnetic Tape Selectric Typewriter to update bibliographies.
  - b. Harry Diamond Laboratories used the three tape sources mentioned above as a data base. They then developed user profiles from a free word access base system (Boolean System) that can be searched by title, abstract, list of descriptors, which is supplied by DDC. The print out is direct to the patron and can also be used as a purchase guide. Mention was made of Institute of Scientific Information in Philadelphia. They will send a representative to conduct very deep interviews of your patrons, compose a list of key words authors and develop user profiles for the fee of about 100 dollars by number of profiles. Weekly service.

- c. Defense Documentation Center has developed the Automatic Dissemination Program which consists of 47 users who have profiles written using descriptors based on the users past requests. Then through a correlation with the MINI MAD FILE (which is the TAB Index on tape) it is determined who gets what and this is all sent out by the computer.

The following are some of the problems brought up in relation to the above topics:

1. The type of information that was appearing in microformat was and is mostly scientific. It is difficult to find information on politics, methods of warfare, history, etc.
2. Security problems with the microfiche format -- how delete and revise, how make external changes of the classification, how sanitize for out-of-house distribution. It was suggested that this problem be brought to the attention of the equipment manufacturers so that they could work on some type of annotator for fiche.
3. These new computer, remote access terminals present the problem of unlimited personnel access where secured material is involved. How do you establish the need-to-know? Again it was suggested that there be an equipment check built in.
4. Again with the new methods of automatic retrieval of fiche it was brought up that the COSATI Standards for fiche are woefully inadequate and that almost everybody has had to adapt them. A new standard is needed.
5. The idea of a DOD regulation on specific types of Libraries was batted about but no consensus could be achieved.

Summary -- (those points not covered in your "Quick Summary of Discussions")

These workshops are of little value if the reports are merely lost in the DDC data banks. We should all see to it that copies of the reports reach the hands of our supervisors.

The great dichotomy between the fact that information systems must be tailored to what the local user needs and the fact that standardization is the only way to make these services available to the majority of libraries was not really resolved. But the services of DDC, especially the UNIVAC on-line and the Automatic Dissemination Program seem to be bridging the gap. Another point is that the diverse status of automation represented by the panel members shows that only a few of the libraries are able to keep pace with DDC and take advantage of these great new services. It was felt that some type of organization within DOD was needed that would have the power to distribute resources to allow for automation requirements.

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